
BLUE BOOK & CATALOG

For the Soap, Insecticide, Disinfectant
and Allied Industries

1936

HEADQUARTERS FOR SOAP PERFUMES

● We supply aromatic products for all requirements. Our laboratory facilities and technical specialists are available to you in any way that they may assist in the solution of your aromatic problems. There is a Givaudan branch office near you (see the list).



Acetophenone
Aldehydes
Amyl Benzoate
Amyl Cinnamic Aldehyde
Amyl Salicylate
Anilipine Liquid
Benzaldehyde F. F. C.
Benzophenone
Benzyl Acetate
Benzylidene Acetone
Bromstyrol
Cinnamic Alcohol
Citral S. S.
Citrene
Citrene No. 2

Citronellol
Coumarin
Cyclamen Aldehyde
Diphenyl Oxide
Eugenol
Geraniol (Soap)
Geranium Synthetic
No. 1086
Geranyl Acetate
Heliotropine
Irisone Pure
Isobutyl Benzoate
Isocugenol
Laurine (Hydroxycitronellol)

Linalyl Acetates
Methyl Benzoate
Methyl Cinnamate
Methyl Coumarin
Methyl Heptin Carbonate
Methyl Ionones
Moskene
Musk Ambrette 100%
Musk Ketone 100%
Musk Xylol 100%
Oil Camphor Sassafrassy
Oil Sassafras Artificial
Phenyl Acetic Acid
Safrol
Terpineol Prime No. 1

SERIES "A" PERFUMES FOR SOAPS

Six delightful scents—Lilac, Jasmin, Bouquet, Rose, Lavender, Cologne.

All the foregoing basic soap perfuming materials of high quality are manufactured at our Plant at Delawanna, N. J. See page 33 for further news of Givaudan Delawanna products, especially spray and disinfectant-deodorants.

GIVAUDAN DELAWANNA INC.

80 Fifth Avenue New York, N. Y.

BRANCH OFFICES: Philadelphia, Los Angeles, Atlanta, Cincinnati, Detroit, Dallas, Baltimore, New Orleans, Chicago, San Francisco, Seattle, Montreal, Havana.

BASIC MATERIALS *for* Soaps & Perfumes

WE ARE headquarters for all the important domestic made aromatics of a prime quality used in soaps and perfumes. Included among these are:

Citral	Eugenol
Geraniol	Iso Eugenol
Citronellol	Benzophenone
Benzyl Acetate	Acetophenone
Benzyl Alcohol	Linalyl Acetate
Hydroxycitronellal	
Alpha Amyl Cinnamic Aldehyde	
Phenyl Ethyl Alcohol	

THE UNGERER standard of quality for basic aromatic materials has long been recognized by the American perfume and soap manufacturer. We solicit your inquiries for testing samples and quotations.



UNGERER & CO.

13-15 West 20th Street
NEW YORK



REG. U.S. PAT. OFF.

FINE CHEMICAL PRODUCTS

for the soap manufacturer

GERANIOL
BENZOPHENONE CRYSTALS
PURE CITRAL
PURE CITRONELLOL
RHODIONE AB
RHODIONE CRUDE
METHYL RHODIONE
DIMETHYL HYDROQUINONE
ISO BORNYL ACETATE
HYDROXYCITRONELLAL

TERPINEOL
BENZYL ACETATE F F C
AMYL SALICYLATE
MUSK XYLOL 100%
MUSK KETONE 100%
MUSK AMBRETTE 100%
SYNTHETIC LAVENDER
ARTIFICIAL GERANIUM
GERANYL ACETATE
TERPENYL ACETATE

ALSO the famous SCUR products manufactured by Société
des Usines Chimiques, Rhône-Poulenc, Paris, France

AMANDOL, Scur **AUBEPINE LIQUID, Scur** **COUMARIN, Scur**
LINALOOL EXTRA, Scur **LINALYL ACETATE, Scur** **MUGOL, Scur**

Accurate chemical control assures the
purity and uniformity of these products

E. I. DU PONT DE NEMOURS & CO., INC.
ORGANIC CHEMICALS DEPARTMENT

Fine Chemicals Division
WILMINGTON, DELAWARE

61 THOMAS STREET
NEW YORK CITY

7 SOUTH DEARBORN STREET
CHICAGO, ILL.



BLUE BOOK and CATALOG

for the Soap, Insecticide, Disinfectant
and Allied Industries



Eighth Edition

1936



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Published by

MAC NAIR - DORLAND COMPANY, INC.

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Foreword

THE BLUE BOOK and CATALOG of the Soap, Insecticide, Disinfectant and Allied Industries is intended as a complete buying guide for these industries—not only for manufacturers of these products but also for those who buy them in bulk for resale. It is the purpose of the publishers to provide as complete a buying service as possible, and suggestions will be welcomed from users of the book as to how it may be improved or expanded in scope.

The 1936 edition is divided into three sections. The first, starting on page 5, contains the condensed catalogs of a representative group of supply houses, arranged in alphabetical order for the convenience of users.

Section two, starting on page 73, gives buyer's guide listings for a complete list of the raw materials, machinery and equipment purchased by manufacturers of soaps and sanitary products. This section also gives sources of supply for bulk and private brand products of all types. These listings are not intended of course as a complete directory of the soap and sanitary products industry, as only those firms are listed which specialize in selling the jobbing trade.

Section three contains a number of reference articles, as well as a review of governmental specifications for the purchase of soaps and sanitary products. Another valuable buying aid for the purchaser of these products is a series of articles by leading manufacturers advising the jobber or bulk buyer what he should look for in and how he should judge various soaps, disinfectants, polishes, etc.

In a work of this type it is unfortunate that errors are unavoidable in the extensive listings. If the name of your firm has been omitted or listed incorrectly, the publishers will greatly appreciate being notified.

THE PUBLISHERS

January, 1936

ORBIS ESSENTIAL OILS

OIL ANISE
OIL BAY
OIL BERGAMOT
OIL CAMPHOR—WHITE
OIL CAMPHOR—
SASSAFRASSY
OIL CASSIA—REDISTILLED
OIL CEDARLEAF
OIL CEDARWOOD
OIL CITRONELLA JAVA
OIL CITRONELLA CEYLON
OIL CLOVES
OIL EUCALYPTUS
OIL LEMON—ITALIAN
OIL LEMON—CAL.
OIL LAVENDER FLOWERS
OIL LEMONGRASS
OIL PEPPERMINT
OIL PETITGRAIN
OIL PINENEEDLES—SIBERIAN
OIL PHELLANDRENE
OIL ROSEMARY
OIL SASSAFRAS—ARTIFICIAL
OIL SASSAFRAS—NATURAL
OIL SPEARMINT
OIL SPIKE LAVENDER
OIL THYME—RED
OIL THYME—WHITE
OIL YLANG YLANG—
MANILA
OIL YLANG YLANG—
BOURBON

AROMATIC CHEMICALS

AMYL CINNAMIC ALDEHYDE
ANETHOL
BENZYL ACETATE
BENZYL ALCOHOL
BENZYL BENZOATE
CARVACROL
CINNAMIC ALCOHOL
CITRAL
CITRONELLOL
EUCALYPTOL
EUGENOL
GERANIOL
SAFROL
STEARIC ACID
THYMOL
CHLORTHYMOL

MEMO

To Manufacturers of
SOAP, INSECTICIDES
and DISINFECTANTS

● ORBIS are the recognized
source for nationally accepted
FINE AMERICAN AND EURO-
PEAN ESSENTIAL OILS,
AROMATIC CHEMICALS
and GUM TRAGACANTH
(whole or powdered)

WRITE FOR SAMPLES!


ORBIS
PRODUCTS CORPORATION
215 PEARL ST., NEW YORK - Factory, NEWARK, N. J.

Catalog Section



BLUE BOOK and CATALOG
for the Soap, Insecticide, Disinfectant
and Allied Industries

for 1936



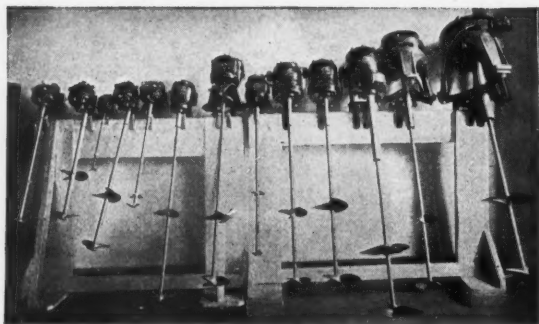
Condensed Catalogs of Firms Supplying
Raw Materials, Machinery and Equipment
to Makers of Soaps, Insecticides, Disin-
fectants and Allied Products.

Hy-Speed EQUIPMENT

for SPEED and ECONOMY in the processing of
Soaps . Disinfectants . Insecticides . Chemicals . Lyes

MIXING

A mixer with the most effective combination of power, speed, propeller size, pitch, and area — a mixer that is designed correctly, balanced perfectly, and constructed ruggedly — a mixer that clamps to any tank or other container you now have — is the one that will do your mixing jobs most thoroughly and at a low operating cost. Let a Hy-Speed Mixer do those mixing jobs in your plant.



Tell us about your mixing problems and we will gladly offer you our suggestions or recommendations. There's no obligation whatsoever.

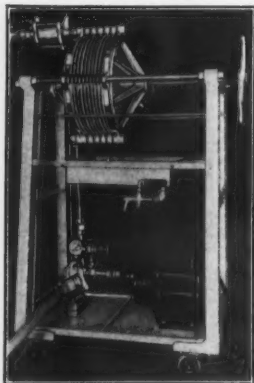
FILTERING

for sediment-free,
attractive-looking liquid products.

If you're intent on turning out a liquid product that is absolutely sediment-free (and will stay that way)—a product that really stands out in attractiveness, you'll be interested in the results obtained with Hy-Speed Ultra Fine Disc Filters.

Hy-Speed Asbestos Discs, the filtering media used, remove every bit of cloud and minute foreign matter and produce a clear brilliant liquid.

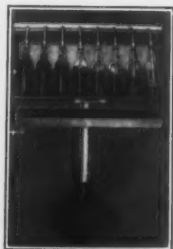
Hy Speed Filters are available in all sizes for any filtering capacity you desire from 1½ G. P. M. to 60 G. P. M. (5 G. P. M. 10-Disc Filter is shown at left).



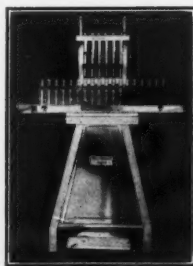
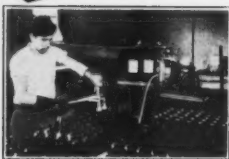
BOTTLE FILLING

any size or type
container, 1 oz. to gals.

There's a complete line of Hy-Speed Vacuum, Siphon and Gravity Bottle Fillers for handling any production capacity you desire on bottles, cans, or jugs from 1 oz. to gals. Write for full details.



ABOVE, improved Siphon Filler:
RIGHT, Portable Vacuum Filler.



Semi-Automatic Filler—2000 qts. per hr.

. Etc.

CAPPING

*assures positively
airtight, leakproof containers.*

If you are using screw caps on your bottles, cans, or other containers, here's an inexpensive, simplified method of tightening them absolutely securely.

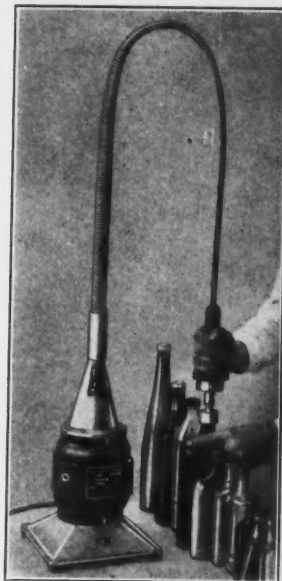
The Hy-Speed Portable Screw Capper is a positive safeguard against waste and rejected shipments caused by leaky bottles that have been capped by uncertain, haphazard methods.

HANDLES ANY SIZE CAP

Instantly adjustable for handling any size cap, the unit is ideal for steady production work or for numerous capping jobs in your plant involving a large variety of caps and bottle sizes and styles.

COMPACT — SIMPLIFIED — INEXPENSIVE

The unit is compact and self contained; it is portable and can be used anywhere in the plant as necessity requires; it is built for continuous duty and costs but a few cents a day to operate.



Every piece of Hy-Speed equipment is backed by the Alsop guarantee of perfect, satisfactory performance.

LABELING

*a neat, inexpensive
method for all containers.*

The Hy-Speed Labelit applies a smooth coating of glue or gum (of any desired thickness) to labels of all types and styles. It comprises a most inexpensive hand method of fast, neat labeling.

Gear driven for dependability; completely covered for cleanliness; instantly disassembled for ease of cleaning; quick, easy adjustments for smooth operation on different labeling jobs.

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Columbus
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SOAP



including the

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published monthly by

MacNair-Dorland Co.

254 W. 31st Street

New York City

Every month the pages of SOAP keep you posted on new developments in the industry. Do not miss any issue. Be a regular subscriber. The cost is small—only \$3.00 per year.



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Factory:
West Haverstraw, N. Y.

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*for Soaps, Perfumes, Pharmaceuticals, Cosmetics, Denaturing,
Insecticides, Fumigation and other purposes*

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Benzyl Acetate

Benzyl Alcohol
Benzyl Benzoate
Ethyl Benzoate

Benzophenone

Acetophenone
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Dimethyl Phthalate

Yara Yara

(Beta-Naphthol Methyl Ether)

K. F. Saponifier

Fat Splitting Reagent

Geraniol

Citronellol
Citronellal

Phenyl Acetic Acid

Methyl Phenyl Acetate
Ethyl Phenyl Acetate
Amyl Phenyl Acetate

Alpha Amyl Cinnamic Aldehyde

Methyl Formate
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Telephone—ASHland 4-2265

Cable Address—Bisulphide, New York City

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Glasgow, Scotland

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van Ameringen

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which include

Perfume Specialties

We are makers of finished perfume oils, ready to use in perfume, toilet water, creams, powders, lotions, soaps and all toilet preparations. Many special oils for special purposes, such as insecticides, dentifrices, disinfectants, proprietary preparations, etc. New odors created for specific purposes, upon request.

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Geranium, Citronella, Lavender, Lemongrass, Lemon, Orange, Bergamot, Bois de Rose, Eucalyptus, Sandalwood and many others.

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Concretes, absolutes of Jasmin, Orange, Tuberose, etc., of high quality.

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SOAP PERFUMING demands special abilities and we have the background in that branch. A large number of soap perfumes are now available, ranging in price from \$2.00 up. *State requirements and send for samples.*

van Ameringen-Haebler, Inc.

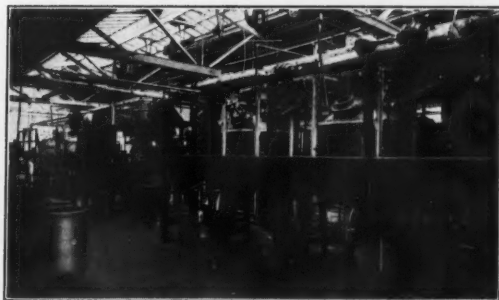
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180 North Wacker Drive
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4708 South Figueroa Street
LOS ANGELES

42 Wellington Street, East
TORONTO, CANADA

*View in the
Reaction Department
of our factory at
Elizabeth, N. J.*



If Soap is a problem Armour can help you

NO matter what your problem — no matter what kind of soap you need or for what purpose you may wish to use it, Armour and Company are in position to help you.

Over 40 years' experience in making high grade soaps for all needs — strict, efficient laboratory control of raw materials and finished products — a long time reputation for fair dealing and satisfaction — branches in all principal cities (over 350 distributing points) — all this is behind every soap product leaving our plants.

Soaps Manufactured by Armour and Company

Auto Soaps	Oil Soap
Castile Soaps	Scouring Powder
Chip Soaps (flakes)	Scouring Soap
Cocoanut Oil Soap	Scrubbing Soap (liquid)
Dry Cleaning Soap	Shampoo Base
Laundry Soap	Shampoo Liquid
Laundry Soap (chips)	Soap Powdered (white neutral)
Laundry Soap (powdered and granulated)	Soap Powders
Liquid Soap Base	Surgical Soaps
Liquid Soap	Textile Soaps
Medicinal Soap (cake)	Toilet Soap Base
Medicinal Soap (liquid)	Toilet Soaps
Mottled Soap	Washing Powder

If you do not find exactly the type of soap you need in the list above, just drop a short note outlining your requirements. Armour and Company maintain a complete and practical Chemical Research Department on call at all times for rendering advice and suggestions. There is no obligation whatever for this service.

INDUSTRIAL SOAP DEPARTMENT

ARMOUR AND COMPANY

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CHICAGO, ILLINOIS

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OFFERED BY AN AMERICAN FACTORY FOR AMERICAN CONSUMERS

Acetophenone
Alcohol C8
Alcohol C9
Alcohol C10
Alcohol C11
Alcohol C12
Aldehyde C8
Aldehyde C9
Aldehyde C10
Aldehyde C11
Aldehyde C12
Aldehyde C14
Aldehyde C16
Aldehyde C18
Aldehyde C20
Amyl Cinnamic Aldehyde
Amyl Salicylate
Amyl Salicylate Ex.
Anethol
Anisic Aldehyde
Benzaldehyde F.F.C.
Benzaldehyde Techn.
Benzophenone
Benzyl Acetate F.F.C.
Benzyl Acetate Extra F.F.C.
Benzyl Alcohol F.F.C.
Benzyl Benzoate
Benzyl Butyrate
Benzyl Cinnamate
Benzyl Formate
Benzyl Iso Eugenol
Benzyl Propionate
Benzyl Salicylate
Benzylidene Acetone
Bornyl Acetate Pure

Bornyl Acetate Cryst.
Bromstyrol
Cinnamic Alcohol
Cinnamic Aldehyde
Cinnamyl Acetate
Citronellal
Citral Pure
Citronellol Extra
Citronellyl Acetate
Coumarin Crystals
Coumarin Powdered
Citronellyl Butyrate
Citronellyl Formate
Citronellyl Propionate
Diethyl Phthalate
Dimethyl Anthranilate
Dimethyl Hydroquinone
Diphenyl Methane
Diphenyl Oxide
Ethyl Benzoate
Ethyl Butyrate
Ethyl Cinnamate
Ethyl Phenyl Acetate
Ethyl Propionate
Ethyl Salicylate
Ethyl Vanillin
Eugenol
Eugenol Extra
Geraniol Extra
Geraniol Pure
Geraniol Soap
Geranyl Acetate
Geranyl Acetate Extra
Geranyl Butyrate
Geranyl Formate

Geranyl Propionate
Heliotropine
Hydroxycitronellal
Indol
Ionone Alpha
Ionone Beta
Ionone Pure
Ionone Soap
Iso Butyl Benzoate
Iso Butyl Phenyl Acetate
Iso Butyl Salicylate
Iso Eugenol Extra
Linalool from Bois de Rose Brazilian
Linalool from Bois de Rose Cayenne
Linalyl Acetate
Methyl Acetophenone
Methyl Anthranilate
Methyl Benzoate
Methyl Cinnamate
Methyl Eugenol
Methyl Heptenone
Methyl Heptene Carbonate
Methyl Ionone
Methyl Iso Eugenol
Methyl Nonyl Acetaldehyde
Methyl Para Cresol
Methyl Phenyl Acetate
Methyl Salicylate
Musk Ambrette
Musk Ketone
Musk Xylol
Nerol Extra
Nerol L.C.

Neroline Crystals
Neryl Acetate
Nonyl Acetate
Oraniol
Octyl Acetate
Para Cresol Acetate
Para Cresol Phenyl Acetate
Phenyl Acetaldehyde Pure
Phenyl Acetaldehyde 50%
Phenyl Acetic Acid
Phenyl Ethyl Acetate
Phenyl Ethyl Alcohol
Phenyl Ethyl Butyrate
Phenyl Ethyl Formate
Phenyl Ethyl Iso Butyrate
Phenyl Ethyl Propionate
Phenyl Ethyl Valerianate
Phenyl Propyl Acetate
Phenyl Propyl Alcohol
Phenyl Propyl Aldehyde
Rhodinol
Rhodinyl Acetate
Safrol
Santalol
Sassafras Artificial
Styralyl Acetate
Styralyl Alcohol
Styrax Essence
Terpineol Regular
Terpineol Extra
Terpinyl Acetate
Terpinolene
Vanillin
Vetivert Acetate
Yara Yara

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Oil Lavender Spike
Oil Rosemary

Oil Thyme Red (Origanum)
Oil Sage

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If you are interested in a perfume odor for any purpose, give us the type odor desired, such as, Rose, Lilac, etc., advise us preparation you wish to perfume, and by all means mention the price you can afford to pay. Our **LABTEST** perfume odors, produced by one of the foremost perfumers in this country, are products of exceptional merit. Consult us and **SAVE**.

AROMATIC PRODUCTS, INC.

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Murray Hill 4-3432

NEW YORK CITY

FACTORY: STAMFORD, CONN.

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Certified Disinfectants

COAL-TAR — Unadulterated high quality coal tar disinfectants, uniform, easily diluted and agreeable in odor. Do not deteriorate with age. Can supply any strength in any quantity from a pint can to a tank car. Rigid laboratory control guarantees consumer satisfaction.

PINE OIL — Prepared from pure steam-distilled pine oil. Dilute easily to form a good white emulsion which does not separate on standing. Baird's pine oil disinfectants have a germicidal strength three to five times greater than pure carbolic acid.

PESTOX Liquid Insecticide

An efficient liquid household insecticide of the pyrethrum type, pleasantly scented. Surpasses in effectiveness the standard of the National Association of Insecticide and Disinfectant Manufacturers. Each lot carefully controlled by the Peet-Grady method. Supplied in bulk for distributors to resell under their own trade-names. Also suppliers of pyrethrum concentrate.

Refined Cresylic Acid
Cresol, U. S. P.

BAIRD & McGUIRE, Inc.

HOLBROOK, MASS.



ST. LOUIS, MO.

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Phone: EVergreen 8-2498.



STAINLESS Cattle Spray

A light colored liquid for spraying cattle to rid them of annoying flies and insects. Contains the active principle of pyrethrum. Will not stain, blister or burn, and has no disagreeable odor. A popular product with farmers and dairymen. Supplied in bulk to the distributing trade only.

Crude Carbolic Acid
Creosote Oils
Mosquito Larvaecide

Cresol Compounds

U. S. P.—Prepared in strict accordance with the U. S. P. requirements. Phenol coefficient, $2\frac{1}{2}$ to 3. Dilutes with water to form clear transparent solutions. Used largely by the medical profession and hospitals.

TECHNICAL — Similar in composition, appearance and odor to Liquor Cresolis Comp., U. S. P., but made from refined cresylic acid as a base. Approximately twice as strong as the U. S. P. product. Clear, amber colored solutions.

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BARRETT CHEMICALS**for the SOAP and DISINFECTANT INDUSTRIES****CRESOL U. S. P.**

Cresol Compound prepared from Barrett Standard Cresol U.S.P. contains less than 5% Phenol and falls well within the limitations of the Federal Caustic Poisons Act.

META PARA CRESOL

Standard grades have boiling ranges of 3°C. and 5°C. with Meta Cresol content 54½% and 52% minimum respectively. Closer boiling fractions supplied as required.

SPECIAL CRESOLS

Special fractions are supplied to meet users' specifications.

TAR ACID OILS, 10%-75%

Carefully blended oils ranging in tar acid content from 10% to 75% for manufacture of disinfectants.

CRESYLIC ACIDS

Ninety-nine per cent and 95% grades of various distillation ranges depending upon requirements.

PHENOL U. S. P.

A pure white crystalline product, 39.5°C. and 40 C. minimum melting points.

HYDROCARBON OIL

A neutral coal-tar oil for high coefficient disinfectants.

SOLVENT NAPHTHA

Approximately 25°C. boiling range.

DIP OIL

A coal-tar base for animal dips.

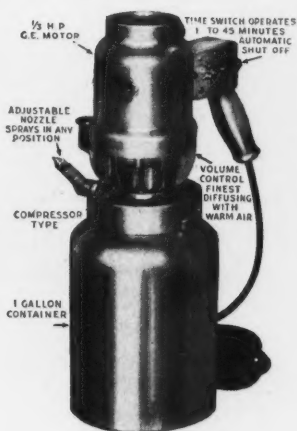
THE BARRETT COMPANY

40 RECTOR STREET, NEW YORK, N. Y.

THE TECHNICAL SERVICE BUREAU of The Barrett Company invites your consultation with its technically trained staff, without cost or obligation. Address The Technical Service Bureau, The Barrett Company, 40 Rector Street, New York.

BREUER'S TORNADO ELECTRIC SPRAYERS

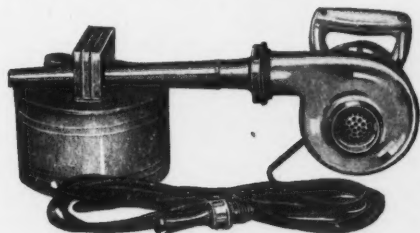
get repeat business because they are by far the most efficient and durable sprayers built. Tornado Sprayers with *Underwriters* approval and a record of high quality and trouble free operation over a long period of years, provide the safest foundation on which to build insecticide business. Protect yourself from customer dissatisfaction and get repeat orders by supplying your trade with the best.



At left, the New TORNADO MODEL 36, Automatic Time Switch—Volume Air Control—One Gallon Capacity—1/3 H.P. G.E. Universal Motor. Here is the finest sprayer ever built. Similar to the now widely used Tornado Model 54 and retaining the automatic time switch, volume air control and adjustable nozzle features, the new Model 36 will spray a big volume of insecticide great distances in finest gas formation. The patented principle of heating and compressing material does the trick. Just the sprayer you need for covering large distances and penetrating with the finest gas every possible source of insect existence.

ALSO COMPLETE LINE OF ELECTRIC SPRAYERS TO MEET EVERY SPRAYING PROBLEM

At right, MODEL 54—One Quart Capacity. It features an automatic time switch set at any point from 1 to 45 minutes—sprays desired amount without any attention whatever—automatically shuts off. Can also be used for hand spraying. Adjustable nozzle can be set for spraying in any position. Also exclusive volume control adjustment permits spraying one ounce every two to four minutes with either fine or heavy spray. MODEL 53 same as Model 54 except does not have automatic time switch.



Above, MODEL 6 Fan Type Unit. Will break insecticide into a very fine mist. Sprays 18' to 20'. 1/3 H.P. G.E. Universal Motor. Norma Ball Bearings, 1 gallon metal container. This model is for larger institutions, warehouses, industrials, etc., and is also highly recommended for moth-proofing solutions. Write today for complete description and circulars.



At left, MODEL 50 Fan Type unit. A fine insecticide atomizer. Sprays distance of 8' to 10'. 1/4 H.P. G.E. Universal Motor, 1 pint glass jar, 20' of rubber covered cable. Model 51 same as Model 50 except 1 quart glass jar capacity.

BREUER ELECTRIC MFG. CO.
863 BLACKHAWK STREET CHICAGO, ILL.

We do not sell insecticides. Our business is manufacturing electric sprayers.

Patented in U. S. A. and Foreign Countries.

ALBERT H. BRUECKE

30 ROCKEFELLER PLAZA

NEW YORK CITY

LURGI EQUIPMENT:

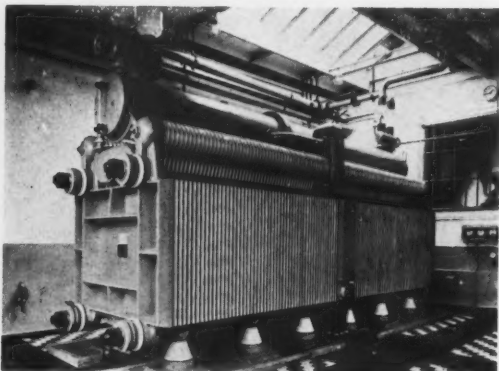
complete refining plants for oils, deodorization plants for oils, high pressure autoclaves for the splitting of oils, super vacuum distillation plants for glycerine, super vacuum distillation plants for fatty acids.

HANSA MILL EQUIPMENT:

continuous solvent extraction plants for oil seeds.



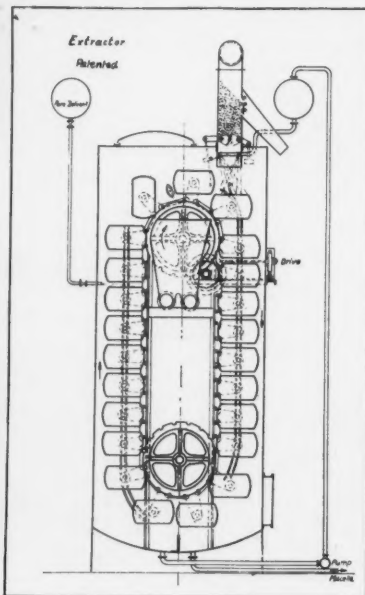
Lurgi Autoclave Ready for Shipment



Bamag Electrolyzer for Hydrogen Production

BAMAG EQUIPMENT:

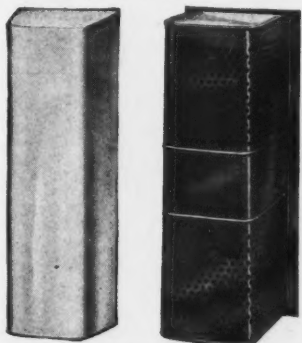
electrolyzers for the production of hydrogen, complete hydrogenation plants for oils.



Sketch of Hansa Extractor

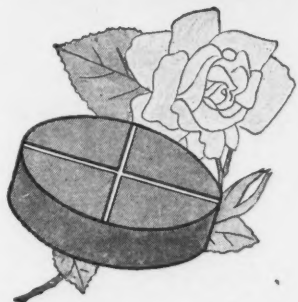
FRAGRANTAIR BLOCKS ARE COLD MOULDED UNDER 60 TON PRESSURE

This permits a longer life and thoro uniformity. Combined with compatible types of fragrantly pleasant, persistent perfumes, FrAGRANTAIR Blocks will go a long way towards helping increase your sales.



Blocks — 4 oz., 24 oz. and 40 oz.

Containers — for above sizes as well as round containers to hold 4 and 6 of the 4 ounce cakes. Most styles in oxidized or white.



Odors — Rose, Pine, Lilac, Oriental.

Packing — Individually in cellophane.



Prices — The surprising part is that you do not have to pay more for these than ordinary blocks.

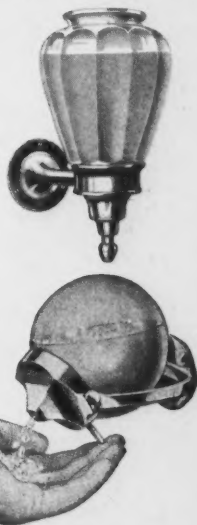
LIQUID SOAPS

ARE NO BETTER THAN THE BASES THEY ARE MADE FROM

Clifton assures you of quality, coupled with favorable prices and combined with skill and manufacturing experience covering many years. There is more to base than mere specification. Try Clifton and find out.

Foamwell Liquid Soap
Fleur-de-Lis Liquid Soap
Semi-Castile Liquid Soap
Baby Castile Liquid Soap
40% Liquid Soap
Semi-Castile Concentrate
Olive Oil Concentrate
Coconut Oil Concentrate
Olive Oil Base

(All Liquid Soaps aged in cypress tanks)



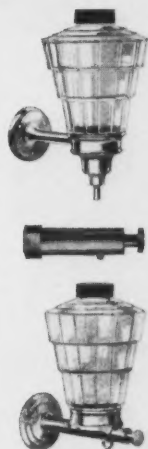
GOOD LIQUID SOAPS

deserve proper dispensing equipment. Clifton Soapers are graceful, long lived and reasonably priced.

Also

Oil Soaps, Floor Cleanser
Rub-No Wax, Metal Polish,
Coal-Tar and Pine Disinfectants, etc.

Attractive Imprint Labels and Circulars.



CLIFTON CHEMICAL COMPANY

247 FRONT STREET, NEW YORK, N. Y.

COLUMBIA

SODA ASH ★
CAUSTIC SODA ★
MODIFIED SODAS ★
CALCIUM CHLORIDE ★

THE COLUMBIA ALKALI CORPORATION
Executive Sales Offices
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Plant at BARBERTON, OHIO

GOOD USED MACHINERY

REBUILT - GUARANTEED

EVERY ITEM SHIPPED FROM OUR SHOPS AT NEWARK, N. J.
IS HONESTLY OVERHAULED AND GUARANTEED

- | | |
|--|---|
| 2—Proctor and Schwartz Soap Chip Dryers: one with late type 2 roll mill. | 12—Labelers — World, Ermold, National, Knapp, Burt makes. |
| 10—Vertical Crutchers, 3600, 3000, 1500, 1200 lbs. capacity; 1 Laboratory. | 25—Dopp steam jacketed Agitated Kettles, 40, 50, 60, 80, 100, 150, 200 gallons, with ribbon, bridge and double motion agitators. |
| 2—H.A. 3 roll Granite Mills, 12"x24". | 1—Blanchard #9 Crusher. |
| 2—H.A. 4 roll Granite Mills, 18"x24". | 100—Steel and Cast Iron Jacketed and Agitated Kettles, 20 gal. to 5000 gals. |
| 3—Day 3 roll watercooled Steel Mills. | 4—Ralston and Jones Automatic Soap Presses. |
| 1—H.A. Jumbo Plodder, 8", motor. | 4—Soap Foot Presses. |
| 3—H. A. Plodders, 10". | 3—Day Powder Fillers and Packers. |
| 1—Rutchmann twin screw Plodder, 6". | 2—4'x9' Cooling Rolls, complete with scrapers. |
| 5—6-Knife Soap Chippers, 18", 20", 30". | 4—24" Kent 4-cake Disintegrators. |
| 1—2 way hand Soap Cutting Table. | 1—36", 1—42" 4-cake Disintegrators, made by Holmes and Blanchard, Boston, Mass., for fine pulverization. Used widely for soap powder and powdered soap. No screens no plugging. |
| 2—Raymond #0000 Pulverizers. | |
| 2—12" Mikro Pulverizers, belt and motor. | |
| 20—Filter Presses, 7"x7" to 42"x42". | |
| 18—Horizontal Mixers, 20 gal. to 500 gal.; jacketed and unjacketed. | |
| 14—Dry Powder Mixers, 50 lb. to 10,000 lb. | |

SEND FOR LATEST SOAP BULLETIN
ASK US FOR ITEMS NOT LISTED

MISCELLANEOUS—Storage and Mixing Tanks, Paste Mixers, Pony Mixers, Liquid and Powder Fillers, Carton Sealers, Pressure and Gravity Filters, Shaving Tube Fillers and Closers, Wrapping Machines, Pulverizing Machines, Rotary Pumps, Slabbers, Boilers, Compressors, etc.

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We Pay Cash for Your Idle Equipment. Send us your list.



COLORFULLY lithographed tin containers compel attention—signify quality—INDUCE SALES. To manufacturers who would accord their products this competitive advantage, Continental offers a complete service which includes the three basic merchandising ingredients—research, design and package development.

CONTINENTAL CAN COMPANY

NEW YORK • CHICAGO • SAN FRANCISCO

LABORATORY CONTROL

**assures
uniform
quality of**

DAVIES-YOUNG PRODUCTS

**NOW, a complete line of sanitary
supplies sold thru jobbers only**

**DISINFECTANTS • INSECTICIDES • DEO-
DORANT BLOCKS • POLISHES • WAXES •
GYM FINISH • FLOOR SEAL • OIL SOAPS
• LIQUID SOAPS • COCONUT BASE SOAPS**

**THE DAVIES-YOUNG SOAP CO.
DAYTON, OHIO**

DERRIS AND CUBE



**DUSTS
POWDERS
EXTRACTS
ROTENONE
SPRAYS
RESINS**

ALL THE VALUABLE PROPERTIES
OF THESE ROOTS IN ANY FORM
DESIRED BY MANUFACTURERS OF

INSECTICIDES

"SERRID" BRAND QUALITY PRODUCTS

DERRIS, INC.

79 WALL ST., NEW YORK

PARADOW

PURE PARADICHLORBENZENE

Six sizes of pure, snow-white crystals, each uniform in size, make it possible to select the correct size and form of Paradow for your packaging, compressing or manufacturing processes. Special sizes available for special uses.

Write for samples and prices.

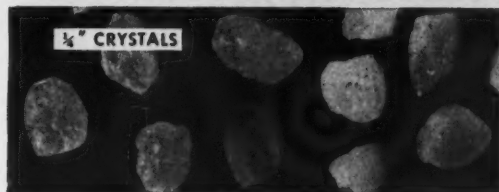
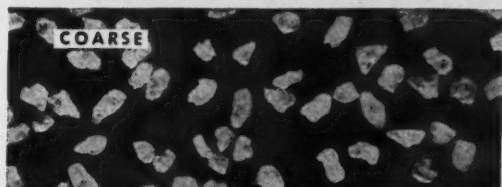
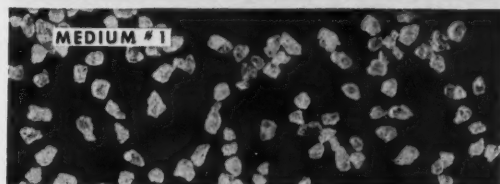
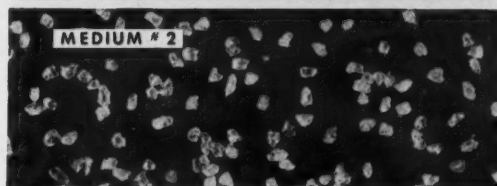
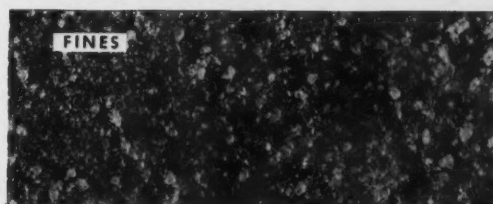
DOW PRODUCTS FOR THE SOAP INDUSTRY

Dow is not only headquarters for Pure Paradichlorobenzene, but also manufactures aromatics such as Coumarin (odor of Sweet Clover), Phenyl Ethyl Alcohol (odor of Rose), Methyl Salicylate (odor and flavor of Wintergreen) and Methyl Anthranilate (odor and flavor of Grape).

The list of Dow Solvents, many of which are used in the soap industry, include Carbon Tetrachloride, Ethylene Dichloride, Propylene Dichloride, Orthodichlorobenzene, and many other organic solvents. In addition, Caustic Soda and Dovicides (disinfectants) are available under the Dow brand.

Let us quote on your requirements for these important chemicals.

THE DOW CHEMICAL COMPANY
MIDLAND MICHIGAN



Increase Your Orders In 1936

.. with dependable Falcon products



TO the aggressive jobber who plans an increase in 1936 business Falcon says, "Here's a line that has long been recognized by customers for its uniformly high quality and absolute dependability. Here's a line that is made under strictest scientific control. Here's a line that in 1935 was handled by more jobbers than in any previous year."

Start your 1936 business off right with Falcon products and make orders come easier. Because with Falcon, you not only meet all competition, but you supply your customers with a better and more dependable product for every sanitation need.

We've a descriptive price list for you. Send for it.

EAGLE SOAP CORPORATION
HUNTINGTON INDIANA

DEODORANTS

Falcon Blocs
Falcon Blockettes
Falcon Crystals

LIQUID TOILET SOAPS

Falcon 40% Concentrated
Falcon 18% Toilet Grade
Falcon 18% Mechanics Grade
Falcon Coconut Oil Shampoo

FLOOR CLEANSERS

Falcon Economy Scrub Soaps
Falcon Liquid Terrazzo Soap
Falcon Liquid Linseed Soap
Vegetable Oil Jelly Soaps
Falcon Cleaning Crystals

FLOOR DRESSINGS

Falcon Non-Buffing Wax
Falcon Liquid Floor Wax
Falcon Floor Varnish
Falcon Floor Seal

INSECTICIDES

Falcon Bed Bug Killers
Falcon Moth Killer
Falcon Fly Killers
Falcon Roach Powder
Falcon Warehouse
& Mill Insecticide

DISINFECTANTS

Falcon Pine Disinfectant
Falcon Formaldehyde Sprays
Falcon Colloidal Disinfectant

PLUMBING CLEANSERS

Falcon Drain Opener
Falcon Powdered Bowl Cleaner
Falcon Porcelain Cleaner



FALCON SANITATION PRODUCTS

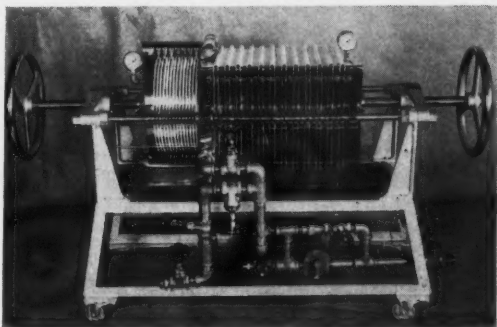
ERTEL ENGINEERING CORP.

LIQUID HANDLING EQUIPMENT

120 EAST 16th STREET
CABLE ADDRESS "ERTELENCOR"

NEW YORK, N. Y.
TELEPHONE: STuyvesant 9-3066

REPRESENTATIVES IN BOSTON, CHICAGO, ST. LOUIS, LOUISVILLE, BALTIMORE, LOS ANGELES,
SAN FRANCISCO, PITTSBURGH, SEATTLE, SAN JUAN, P. R.



The Ertel Three-Way Multiple Filter combines the functions of 3 machines in one single unit.

1. Can be used as a pre-filter.
2. Disk filter can be used as polishing filter alone.
3. Complete, this equipment makes a combination pre-filtering and disk filtering unit.

Reduces filtration costs 30 to 70%.

Liquids which could not otherwise be filtered through disk filters are efficiently handled by virtue of pre-filtering combination.

It is an all purpose filter . . . unique construction makes possible handling any type of liquid.

Available in many sizes for various capacities.

Unusual pump construction makes it adaptable as transfer pump when not filtering.

Standard models of high grade bronze, nickel plated—all valves and parts easily accessible.

Mounted on castors, it can be transported from one part of plant to another without difficulty.

PRODUCTS

Asbestos Disk Filters, Asbestos Filter Sheets, Pre-Filters, Three-Way Multiple Filters, Stainless Steel and Glass-Lined Tanks (open or closed), Portable and Semi-Automatic Vacuum Bottle Fillers (with or without conveyor), Portable Electrical Mixers, Portable Pumps.

★

USES

Filters: Clarifying, polishing and germproofing any type of liquid.

Tanks: For storing or mixing liquids.

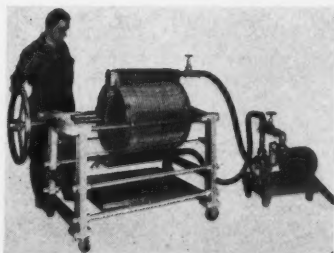
Bottle Fillers: 3, 6, 8 or 12 spout fillers for the rapid filling of liquids.

Portable Mixers: For mixing heavy and light liquids.

Portable Pumps: For transferring liquids from tank to tank.

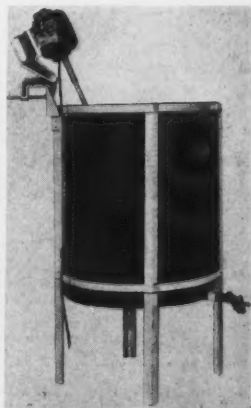
TANKS

Ertel Glass Lined Tanks, built in sizes from 15 to 350 gallons, and Ertel Stainless Steel Tanks, built from 15 to 1,000 gallons; are acid resistant.



MIXERS

The Ertel Portable Mixers are furnished in all sizes and for any purpose. Scientifically designed, accurately balanced, they are light, easy to handle and are always ready for instant service. The handy grip, an exclusive feature of the Ertel mixer, makes it truly portable.



FEDERAL

Preservatives and Polishes

for Every Type of Surface

Federal Floor Preservatives and Polishes are highly perfected products. They are the result of constant research, both in the laboratory and in practical usage. Our entire technical staff has concentrated on the development of these finishes. They are specialized products made by America's largest manufacturer of Preservatives and Polishes selling in bulk.

In this list will be found the entire Federal Line with a quality product for every purpose and every surface.

NO-BURN GYM FINISH

An extremely hard, durable finish that will not rubber-burn on gymnasium floors and also one with such remarkable durability it can be used on all types of interior or exterior surfaces including dance floors, school furniture, desks, seats, etc. Applied with a lamb's-wool mop, applicator or cheesecloth pad.

G. F. B. No. 2

This is No-Burn Gym Finish except made in a standard body for brush application.

G. F. B. No. 3

Is the same remarkably durable finish as No-Burn Gym Finish but intended for use only on surfaces where a hand rubbed finish is desired.

G. F. B. CONCENTRATED BASE COLORS

Highly perfected concentrated color bases for use with No-Burn Gym Finish to impart colors as well as extreme durability on wood, concrete and cement surfaces. Made in Light Oak, Dark Oak, Light Gray, Dark Gray, Walnut, Maroon, Green.

G. F. B. CONCENT'D ALUMINUM BASE COLOR

A perfected concentrated aluminum base color for all types of metal work such as tanks, bridges, pipes etc., on both inside and outside surfaces.

MOP-VAR

A specialized product to be applied with a mop or other applicator. Reduces maintenance and application costs. For wood, concrete, hard mastic or magnesite, cork and cork tile.

LIGHTNING LUSTRE

A no-rub, no-polish wax for rubber tile, soft composition, linoleum, and as a maintenance finish for practically any surface.

VAR-LIN

A preservative and polish combining the hardest waxes of best quality, varnish gums and quick drying solvents. Very durable and practically eliminates the slipping hazard. Polishes to a beautiful, glossy film.

LIQUID OIL BASE WAX

A wax of the oil base type. Applied with a mop or applicator. Buffs and polishes beautifully. A superior product of its type.

Our laboratories are constantly developing new products and perfecting new methods and treatments for beautifying and preserving all floor surfaces.

Write for complete information, testing samples and prices.

FEDERAL VARNISH COMPANY

337 SO. PEORIA STREET

CHICAGO, ILL.

TERRAZZO SEALER

The perfect sealer for terrazzo and marble floors. Reduces cost of maintenance. Prevents penetration of dirt.

CHAIN STORE SEALER

This is a highly specialized finish for wood floors to meet peculiar conditions and requirements of large organizations operating chain units. Applied by spraying or large lamb's-wool applicator. Forms a hard, durable finish that will not stain merchandise accidentally dropped on it.

RUBBER LACQUER

A superior lacquer developed particularly for use on rubber and rubber tile. Dries rapidly, easily applied and very durable. Will not discolor light shades.

LINOLEUM LACQUER

Specially made for printed, lacquer finished inlaid linoleum and congoium or Sealex types of linoleum. Dries in 30 minutes, easy to apply and will not cause light, delicate shades to fade or discolor.

GYM FINISH CLEANER AND POLISH

Specially developed for the cleaning of gymnasium floors, hand ball and basket ball courts, etc. Cleans perfectly rubber shoe marks and other soiling elements.

BUFFING WATER WAX

A water wax type of finish developed by our chemists but unlike the self-polishing water waxes requires buffing to bring out the beauty of finish. Very popular wherever this type of wax is used.

LINOLEUM, RUBBER & TERRAZZO CLEANER

Meets perfectly all requirements for a superior cleaner for these surfaces. Keeps the surface always in proper condition and prevents deterioration.

GYM FINISH MARKING ENAMELS

Another Federal specialized product made for the purpose of marking hand ball courts, basket ball floors, running lanes, etc. Has the remarkable wearing quality of Gym Finish and possesses great covering and hiding power. Made in White, Red, Black.

STREET MARKING OR TRAFFIC PAINT

A rapid drying paint for marking traffic lanes, parking spaces and similar uses. For both inside and outside use. Dries for traffic use in 30 minutes. Has remarkable wearing quality necessary for a product of this kind.

AROMATIC PRODUCTS

For Soap, Disinfectant, and Insecticide Manufacturers

AROMATIC CHEMICALS

Manufactured at our Brooklyn factory under accurate chemical control, these aromatic chemicals are of the highest degree of purity, and are always of uniform quality. The following are of special interest to soap makers:

AMYL CINNAMIC ALDEHYDE	GERANIOLS	LINALYL ACETATE
AMYL BENZOATE	GERANYL ACETATE	METHYL PARA CRESOL
BENZYLIDENE ACETONE	ISO BUTYL BENZOATE	PARA CRESOL ACETATE
CITRAL	ISO EUGENOL	RHODINOL
EUGENOL	LINALOOL	TERPENYL ACETATE

PERFUMES FOR SOAPS

A complete range of floral notes, bouquets and oriental odors. **Will not discolor.** Special odors can be readily supplied.

INSECTICIDE SPRAY PERFUMES

We manufacture a suitable variety of odors for insecticide sprays. All of these odors are pleasant in character, powerful as to coverage and economical, costing on the average, less than three cents to perfume a gallon of spray.

PERFUMES FOR DEODORANT BLOCKS AND CRYSTALS

COLOROMES—Will perfume and color naphthalene and para dichlor benzene in (Trade Marked) one simple operation. A wide variety of odors and colors are available. Perfume also supplied without color. With the use of Felton Coloromes, the odor remains until the last particle of naphthalene or para has evaporated.

WATER SOLUBLE PERFUMES

AQUAROMES—Completely soluble in water to a clear solution. A wide variety (Trade Marked) of odors for theatre sprays, liquid soaps, soap base shampoos, formaldehyde solutions, etc.

SAMPLES AND QUOTATIONS ON REQUEST.

FELTON CHEMICAL COMPANY, Inc.

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Aromatic Chemicals — Natural Isolates — Perfume Oils — Artificial Flower & Flavor Oils

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ST. LOUIS, MO.
245 Union Blvd.

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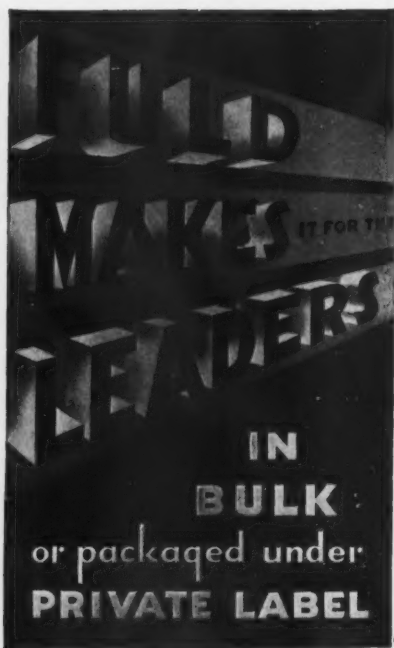
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Sixers”***

for more “pay dirt” from



DISINFECTANTS
DEODORANTS
FLOOR WAXES
and
TREATMENTS
POLISHES
INSECTICIDES
CLEANING COMPOUNDS
DEODORANT BLOCKS
PLUMBING SPECIALTIES
OIL AND SOFT SOAPS
LIQUID AND BASE SOAPS



FULD BROS. INC.
BALTIMORE, MD.

SODIUM

(NILE BLUE)

FLUORIDE

The standardization of Sodium Fluoride Colored Official Nile Blue has effectively done away with hazard to the public. No one will mistake the blue tinted powder for a food ingredient . . . Its potency as an exterminating agent maintains it as the dominant insecticide for the commercial and household destruction of insect pests . . . This General Chemical Company product excels in free-flowing quality and fluffiness.

TRISODIUM

PHOSPHATE

The Standard Purity of this, as of all other General Chemical Company products, is a matter of common knowledge. The practical advantage of the Company's standard of packaging assures the customer's receipt of his material in its original condition.



*The Company's Products
include also:*

**SODIUM SILICATE
ACETIC ACID**

*and other Heavy Chemicals
of Standard Purity*

GENERAL CHEMICAL COMPANY

40 RECTOR STREET, NEW YORK, N. Y.

Cable Address: LYCURGUS, N. Y.

Sales Offices: Buffalo, Chicago, Cleveland, Denver, Los Angeles, Philadelphia, Pittsburgh, Providence, San Francisco, St. Louis

THIS *Getz Em!*

Not the Cheapest . . .

But the Best!

A HANDY BLOWER
that can be used in all
positions — saving pow-
der and getting into the
spots where the powder
kills all roaches and
insects. An indispen-
sable tool for profes-
sional exterminators. A
profitable jobbing side-
line for sanitary sup-
ply houses.



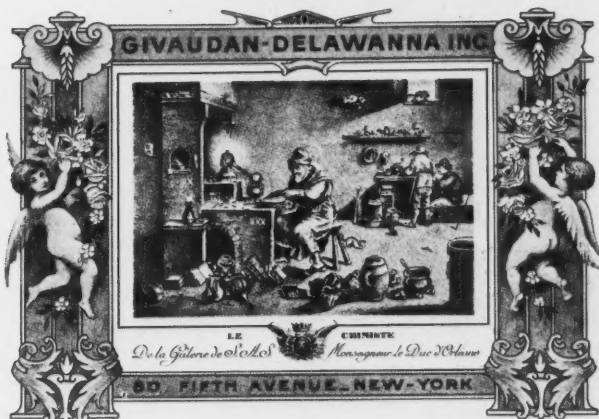
GETZ EXTERMINATORS INC.

1139 PINE STREET

ST. LOUIS, MO.

HEADQUARTERS

FOR SPRAY AND DISINFECTANT REODORANTS



We have developed and offer you a number of excellent perfuming and reodorizing oils for fly sprays, paradichlorobenzene and naphthalene blocks, cleaning compounds and polishes. These cover all price requirements.

The following are a few which have met with marked success:

CITRENE—Use CITRENE instead of Citronella in your soap, cleaners, and polishes. Stronger, pleasanter, cheaper.

FLORENE—Sharp, clean, refreshing scent that covers kerosene odor. Excellent for fly sprays and insecticides.

KERODOR No. 1—A very inexpensive deodorant, for neutralizing the kerosene odor in insecticides. Kerodor is **EFFECTIVE** . . . it gives sprays the advantage of a pleasant odor.

ODRENE—Powerful, low price oil for use alone or in combination in sprays, in polishes.

LAVENE—Especially good as a deodorant in polishes. Also effectively covers kerosene odor in fly sprays.

LILAC SPRAY OIL B-3223-2—Especially blended to overcome the unpleasant odor of kerosene insect sprays.

NEW MOWN HAY OIL B-3470—This type of odor is one of the most popular in sprays. B-3470 is especially effective in overcoming the kerosene smell.

PARATINTS—Paratints color and perfume paradichlorobenzene blocks, bath salts, or moth balls in one operation. And they do it better . . . because of uniform penetration of the crystals . . . more effective perfuming oils.

See inside of the front cover for information on Givaudan soap perfumes and other products.

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Philadelphia, Los Angeles,
Atlanta, Cincinnati, Detroit, Dallas,

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D E L A W A N N A I N C .

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New York, N. Y.

BRANCHES
Baltimore, New Orleans,
Chicago, San Francisco,
Seattle, Montreal,
Havana.

“GOOD” PRODUCTS- at “GOOD” PRICES

Sixty-eight years of experience in the manufacturing chemical field insure our ability to supply products of consistent high quality and definitely standardized as to purity and strength. All Good products are priced at levels which enable the jobber to compete on volume business. Ask for a copy of our current price list.

Disinfectants

Keystone Coal Tar Disinfectants
(coef. 2 to 20)
Keystone Antiseptic Disinfectant
Keystone Liquor Cresolis, U. S. P.
Keystone Liquor Cresolis, Tech.
Keystone Pine Oil Disinfectant No. 40
Keystone Pine Oil Disinfectant No. 100
Keystone Saponified Cresol Solution
Keystone Drip Machine Fluid
Zaxol Disinfectant
Chlorozone Disinfectant

Soaps

Keystone Auto Soap
Keystone Liquid Soaps
Keystone Vegetable Oil Soap
Keystone Pine Cleaner Soap
Keystone Surgical Soap, U. S. P.
Keystone Coconut Oil Soap Base
Keystone Fish Oil Soaps
Keystone Scouring Soap, Fine
Keystone Scouring Soap, Coarse
Keystone Saddle Soap
Keystone Concentrated Scotch Soap

Cleaners

Keystone Wax Base Cleaner
Keystone Crystal Cleaner
Keystone Drain Pipe Solvent
Keystone Rug Cleaner

Insecticides

Keystone Insect Killer (Liquid)
Keystone Fish Oil Spray Soaps
Keystone Nicotine Sulphate 40%
Keystone Bed Bug Killer
Keystone Insect Killer (Powder)
Keystone Concentrated Insectifuge
Keystone Theatre Spray

Waxes and Polishes

Keystone Self-Polishing Wax
Keystone Glosster (Liquid Wax) Hygienic
Keystone Glosster (Paste Wax) Hygienic
Keystone Cream Furniture Polish
Keystone Lemon Oil Polish
Keystone Cedar Oil Polish
Keystone Non-Inflammable Metal Polish
Keystone Floor Oil
Keystone Floor Dressing

Chemicals

Naphthalene, Ball and Crystals
Carbon Tetrachloride
Trisodium Phosphate
FIRE EXTINGUISHER RECHARGES
Soda & Acid Recharges
(for 2½ or 3 gallon extinguishers)
Fire Extinguisher Liquid
(Carbon Tetrachloride Base)

JAMES GOOD, INC.

Kensington

Philadelphia





Grasselli TRI-SODIUM PHOSPHATE

AS OUR process permits Grasselli T. S. P. to cure, it is Free Flowing.

Non-Sifting Packages

Shipped to you in barrels with paper liner — no loss either in transit or storage. Also comes in kegs and bags. Grades — fines, globular, medium, coarse and flake.

Grasselli Service

The 20 Grasselli branches and

warehouses offer you — (1) More convenient proximity. (2) Quicker delivery. (3) Economy of freight rate. (4) Larger stocks, hence complete shipments. (5) Quality backed by a chemical reputation of 97 years.

Try Grasselli on your next order for T. S. P. Just write, wire or phone our nearest branch below.

*Let Us Also
Quote You On*

Silicate of Soda
Caustic Soda
Soda Ash
Carbon Tetra-
chloride
Paradichloro-
benzene
Sodium Fluoride

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BLEACHING POWDER MURIATIC ACID
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TRICHLORBENZENE TETRACHLORBENZENE
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AMMONIUM BENZOATE BENZOIC ACID
BENZOIC ANHYDRIDE BENZOYL CHLORIDE
PARA-NITROBENZOYL CHLORIDE
BENZYL CHLORIDE BENZYL ALCOHOL
BENZOTRICHLORIDE CHLORTOLUENE
ALUMINUM CHLORIDE ANHYDROUS
ANTIMONY TRICHLORIDE ANHYDROUS
ARSENIC TRICHLORIDE ANHYDROUS
TIN TETRACHLORIDE ANHYDROUS
FERRIC CHLORIDE SOLUTION
FERROUS CHLORIDE SOLUTION
SULFUR MONOCHLORIDE
SULFUR DICHLORIDE
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HOOKER PARADICHLOR-
BENZENE IS SPECIALLY
PREPARED FOR USE IN
THE MANUFACTURE OF
MOTH PREVENTIVES AND
DEODORANTS AND IS
OFFERED IN SIX STANDARD
CRYSTAL SIZES.
READY FOR IMMEDIATE
SHIPMENT IN 200 AND 100
POUND BARRELS AND 50 AND
25 POUND KEGS.



CAUSTIC SODA . . .

IMMEDIATE DELIVERY
OF SOLID AND FLAKE
CAUSTIC SODA IN STEEL
DRUMS, LIQUID IN DRUMS OR
TANK CARS, GROUND AND
POWDERED IN STEEL DRUMS
OR HEAVY WOODEN BARRELS.
HOOKER SERVICE MEN,
CHEMISTS AND ENGINEERS
GLADLY ASSIST CONSUMERS
FREELY ON EQUIPMENT DESIGN
AND USE OF THIS PRODUCT.

OPPORTUNITIES TO QUOTE WELCOMED

HOOKER ELECTROCHEMICAL COMPANY

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PLANT—NIAGARA FALLS, N. Y.
SALES OFFICE: 60 E. 42ND ST., NEW YORK

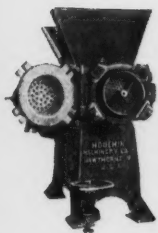
WESTERN

PLANT—TACOMA, WASH.
SALES OFFICE: TACOMA, WASH.

Houchin Machinery Co.

Hawthorne, N. J.

Soap Machinery



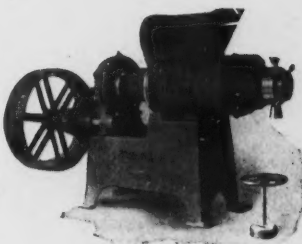
Combination Plodder

With this machine toilet soap can be produced without the use of mills. Our "F" Size machine is ideal for making Sample Cakes.

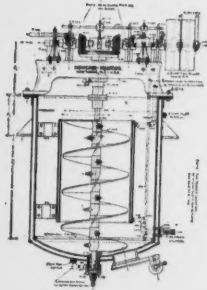
Standard Jumbo Plodder

This machine is used in most soap factories.

It is used also in our mill-less method.



Perfection



Our Perfection machine is standard with the majority of soap makers.

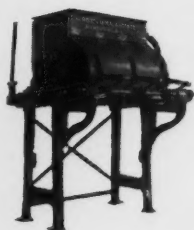
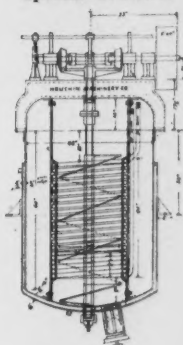
It is the best machine for making cold made — half boiled and floating soaps. Made in several sizes.

Crutchers

Our special machine is ideal for making shaving soaps.

Kettle made of nickel clad steel, coil and blades of monel metal. Also has our plug type valve. Made in several sizes.

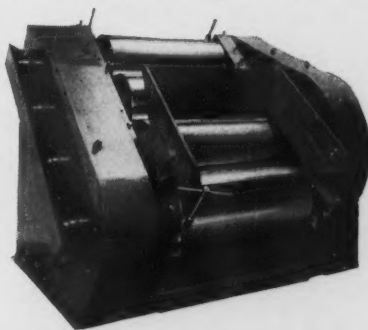
Special Crutcher



Ideal Amalgamator

This machine has lately been improved with a new locking device operated by chains on each end. It has been so designed that the soap can be emptied into hopper of mill or plodder. Lately we have made several machines using nickel clad steel for the kettle, monel metal for the blades.

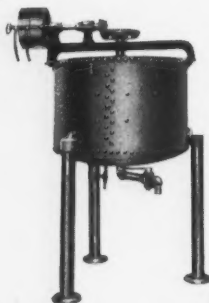
This cut represents our latest Type F Mill. Rolls are 18" dia. 40" long, water cooled. Frames are very heavy, bearings very large. Gears run in oil. Gears and bearings are entirely covered, all mounted on a heavy cast iron base.



HUBER MACHINERY

"Built To Last"

With over forty years experience and a pride in producing good work, we feel certain of satisfying any critical demand. Wax crayon and candle machines are also part of our manufactured products.

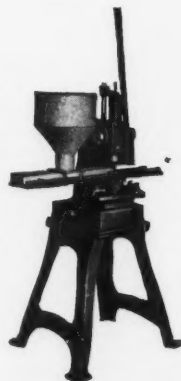


For Liquid Soap

Mixing machines of exceptional merit for base or percentage production and manifold other uses.

Para Block Press

A powerful press with all working parts steel to withstand pounding and abuse. Excellent and rapid production.



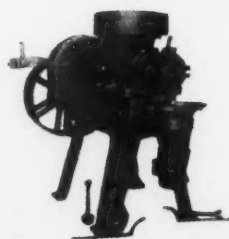
Huber Electro-Perfection Crutcher

Electrically Driven Two Speed and Reverse Crutcher. Built in three sizes:—1500—2400—3000 lbs.



Huber Dry Mixers

For Para Crystals, colors and perfumes. Cleaners, bath salts, roach powders, fertilizers, sweeping compounds, smoothing face and shaving creams, etc.



Twin Screw Plodders

Makers of the Famous Rutchman Mills and Plodders used since 1860. None better.

HUBER MACHINE COMPANY

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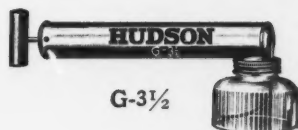
Brooklyn, N. Y.

HUDSON SPRAYERS

SUCCESS INSURANCE

FOR GOOD

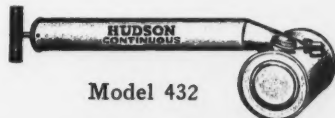
INSECTICIDES



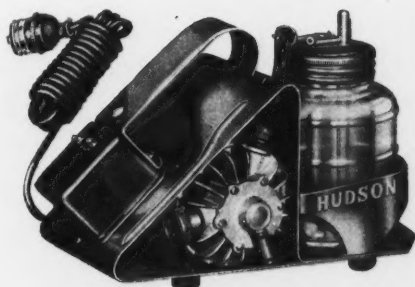
G-3½



F-10



Model 432



No. 300 Electric Sprayer

Proper application means everything in destroying insect pests. That's why Hudson has put so much emphasis on complete diffusion of spraying solutions—to get the fine penetrating fog that covers and kills. Customers who use your insecticides with these Hudson sprayers are satisfied customers.

G-3½—GLASS JAR SPRAYER; 4½ oz. capacity. Permits clear view of contents; wide base prevents tipping; large mouth for easy filling; curved syphon tube for spraying upright to use the last drop. An inexpensive sprayer for household use.

F-10—CONTINUOUS SPRAYER. 18 oz. capacity; tank of heavy tin, lock seamed and leakproof. Especially adapted for handling oil solutions, household insecticides, disinfectants, etc. Removable brass nozzle and syphon tube.

Model 432 — CONTINUOUS SPRAYER. Approximately one-quart capacity. Sturdily built, strongly soldered to stand abuse and keep working parts in proper alignment. Handles all solutions; produces a fine continuous spray.

No. 300 ELECTRIC SPRAYER. 1/10 HP, AC-DC motor has built-in compressor unit and automatic time switch for any spraying period up to 30 minutes; a big feature for stores, food shops, etc., for spraying after hours. Fine mist penetrates entire room without leaving coating of film.

There's a Hudson sprayer of the proper size and type for every spraying job—large or small. Every one gives you the complete break-up that means economy with greatest killing power.

"A Hudson Sprayer for Everybody — Everywhere"

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CANDELILLA, Light and Dark.

CARNAUBA, Refined, entirely cleaned and uniform.

CARNAUBA, 1, 2 and 3: Yellow 3 N. C. and 3 Chalky, Bags 200 lbs.

CERESINE, All degrees melting points; Orange, Yellow and White; Bags 110 and 200 lbs.

MONTAN, Bleached and Crude; Bags.

OZOKERITE—White and Yellow; 65 to 78° C. Stands 85 lbs.

JAPAN WAX—Cases 224 lbs.

LANOLIN—Refined, U. S. P. Domestic and Imported.

LARVACIDE—(Chlorpicrin) Fumigant. Cylinders 10 to 100 lbs.

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CARBONATE POTASH—Calcined, 80/85% - 96/98% - 98/100% - also LIQUID, Water White, sparkling clear; guaranteed minimum 47% K_2CO_3 .

CAUSTIC SODA—Solid fused 76%, drums 700 lbs.—Flake 76%, drums 125 and 400 lbs., Crystals, bbls. and drums, 500 lbs. Ground, drums 500 lbs. Liquid, tanks and drums.

BLEACHING POWDER—(Chloride of Lime) Exceptionally uniform.

STEARIC ACID—Imported, double and triple pressed; powder and slabs; bags and cases, 221 lbs.

OLEIC ACID—Red and White.

SOFT AMORPHOUS SILICA—For use in Paints and Cleansing and Polishing Materials. Water and Dry Ground. Uniformly fine.

BORIC ACID—99½% and U. S. P.; Powdered, Crystals and Granulated, bbls. 300 lbs. Bags 100 lbs.

BORAX—Powder; Granulated. Bbls. 300 lbs. Kegs 100 lbs. Bags 125 lbs.

AQUAPHIL—A cream and salve base; highly water absorbent.

CHALK—Precipitated. Light, Medium and Heavy. U.S.P. bags and bbls.

SODA ASH—Light 58%; bbls. 276 lbs., bags 200 lbs.

SODIUM FLUORIDE—Light, fluffy; 95/97%; bbls. 331 lbs.

SODIUM SILICATE—Various grades and packages.

TRI SODIUM PHOSPHATE—Crystals and granulated.

*In addition we manufacture, import and distribute a broad line of industrial chemicals
See index under specific items.*

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Design and Construction of Equipment and Plants for Producing and Processing Fats, Oils, Soaps and Related Products

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Complete Plants or Unit Equipment for:

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Animal or Vegetable Margarine Manufacture
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SOAP MANUFACTURE

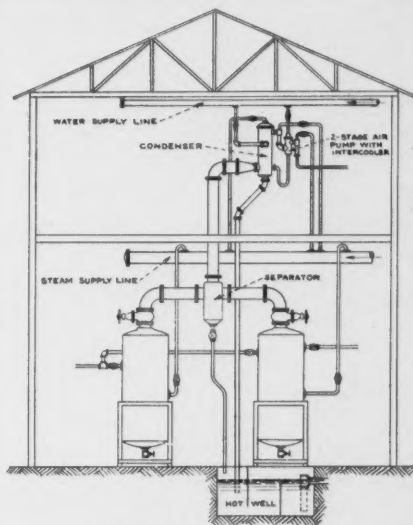
We design, build and install complete plants for manufacture of toilet or laundry soap, soap powder, liquid soap, shampoo and soapmaker's specialties. Stock-bleaching and Twitchell plants for soapmakers.

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Equipment for production of fatty acids by Twitchell, Autoclave and Saponification methods. Fatty acid bleaching plants. Batch and continuous or semi-continuous distillation plants.

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We offer modern hydrogenation equipment of continuous or intermittent type, including catalyst producing and reactivating units.



Two-vessel Deodorizing Outfit with Barometric Vacuum Equipment

DEODORIZING & BLEACHING

We offer all modern types of deodorizing equipment, high or moderate vacuum, steam, oil, electric or direct heat, special iron or stainless construction with jet, barometric, or surface condensation of vapors.

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Our experience of many years, specializing in fatty oils and soaps, qualifies us to furnish intelligent appraisals and reports on existing or projected plants and processes in these fields.

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Estimates on equipment or services will be furnished cheerfully upon request. Supply of complete data with inquiries will save much time in preparation of estimates.

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"NATIONAL" holds a "clear wire"
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We supply the labels with your name imprinted

IF YOU WANT GOOD PRODUCTS AT RIGHT PRICES, DROP
US A LINE. PRICES, SAMPLES AND FURTHER INFORMAT-
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NEW YORK SOAP CORP.

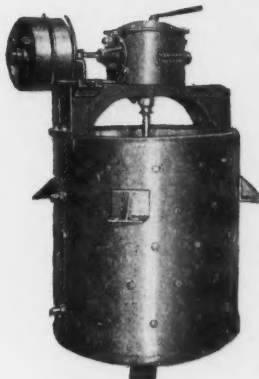
294 Pearl St.

New York, N. Y.

SOAP MACHINERY

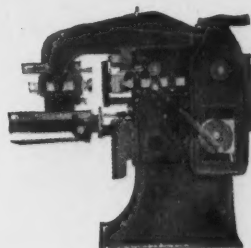
New and Used Special Offerings

NEW SOAP CRUTCHERS



This Newman brand new, all steel steam jacketed soap crutcher will crutch any kind of soap. We also build another crutcher especially adapted for laundry soap in addition to other new soap machinery such as frames, cutting tables, etc. Send for complete list.

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JONES Automatic Combination Laundry and Toilet Soap Presses.

Used Specials

for the Soap, Chemical, Cosmetic and Allied Trades

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H-A 1500, 3000, 5000 lbs. capacity. Steam Jacketed Crutchers.
Dopp Steam Jacketed Crutchers. 1000, 1200, 1500 lbs. and 800 gals. capacity.
Jones Automatic Soap Presses
Ralston Automatic Soap Presses.
Scouring Soap Presses.
Empire State, Dopp & Crosby Foot Presses.
2, 3, 4, 5 and 6 roll Granite Toilet Soap Mills.
H-A 4 and 5 roll Steel Mills.
H-A Automatic and Hand-Power slabbers.

USED EQUIPMENT

Sperry Cast Iron Square Filter Presses, 10, 12, 18, 24, 30 and 36 inch.
Perrin 18 inch Filter Press with Jacketed Plates.
Gedge-Gray Mixers, 25 to 6000 lbs. capacity, with and without Sifter Tops.
Day Grinding and Sifting Machinery.
Schultz-O'Neill Mills.
Day Pony Mixers.
Gardiner Sifter and Mixer.
Proctor & Schwartz large roll Soap Chip Dryers complete.

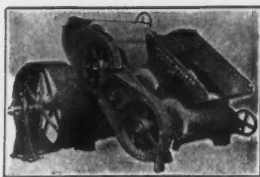
USED EQUIPMENT

Proctor & Schwartz Bar Soap Dryers.
Blanchard No. 10-A and No. 14 Soap Powder Mills.
J. H. Day Jaw Soap Crusher
H-A 6, 8 and 10 inch Single Screw Plodders.
Allbright-Nell 10 inch Plodders.
Filling and Weighing Machines for Flakes, Powders, etc.
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All used equipment is rebuilt in our own shop and is guaranteed in first-class condition.

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3 AND 5 ROLL STEEL MILLS FOR SOAP FLAKES
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Niagara Caustic Soda liquid, flake or solid

You can tell it's unusually pure—because it is so *white*.

Niagara Alkali supplies liquid Caustic Soda of standard strength, 48° to 50° Baumé. This represents about 48 to 48.75 per. cent of sodium hydroxide in the solution. It is shipped in tank cars of 8,000 gallons, averaging about 100,000 pounds of soda liquor, equivalent to approximately 46,000 pounds solid 76% soda; and in 10,000 gallon cars containing about 125,000 pounds of soda liquor, equivalent to approximately 58,000 pounds solid 76% soda.

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The first made in this country! Our experience in producing this difficult chemical is valuable to you.

Niagara Para (unadulterated paradichlorobenzene)

Fine, white, uniform crystals, in any size or type of container you prefer.



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For packaging room foremen, plant superintendents and every executive concerned with the problems of automatic packaging—Pneumatic has prepared at considerable cost and effort this most complete handbook of modern packaging methods and procedure. It discusses and answers in simple, understandable manner, all of the technical questions and considerations of machine packaging. It offers practical recommendations on the multiple decisions that must be made, even to the inclusion of actual packaging materials, samples, e. g., cardboard, special papers and typical wrappers. It is a completely up-to-date, correct and authoritative guide which Pneumatic will gladly send—free—to any responsible and interested person actually connected with packaging operations.

Please make your request for your copy of this limited and valuable book on your firm's business letterhead.

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PER CONTAINER

Proven Economy OF MAINTENANCE AND OPERATION

There is more Pneumatic Machinery employed in the packaging of soap than any other kind. Soap manufacturers have always found it ideal for their purposes—answering their needs with an efficiency, accuracy and economy unequalled by any other method. From years of intimate experience Pneumatic knows the packaging problems of the soap field—and has developed the machines to satisfactorily meet them, at the “lowest cost per container.” The type and number of soap manufacturers using Pneumatic Machinery are conclusive evidence of its outstanding leadership in this field. Save time and trouble—come straight to Pneumatic.

PNEUMATIC EQUIPMENT

CARTON FEEDING and BOTTOM SEALING

Eight different units for this important task. Speeds range from 10 to 80 per minute. Completely protected against machine part breakage or carton spoilage.

CARTON LINING

Small cartons or giant sizes can be lined automatically on one of three models built by Pneumatic for this operation. Glue seal or heat seal equipment allows handling practically any lining paper material.

FILLING and WEIGHING

Cartons, bags, canisters, bottles, cans or any container can be filled or weighed on one of the 30 different units built by Pneumatic for maximum accuracy at the speed you need.

CARTON CLOSING

Here too, Pneumatic maintains its policy of complete equipment for every packaging operation. Ten different models to care for any package size at speeds ranging from 10 to 80 per minute.

CARTON TIGHT WRAPPING

Tight wrapping will improve your package in many ways. Pneumatic offers three units to choose from in order to handle your package right. Small sizes and large, speeds range from 20 to 65 per minute.

VACUUM FILLING (Liquids and Semi-Liquids)

In the liquid packaging field Pneumatic offers an equally complete equipment selection. At least ten contrasting models for vacuum filling bottles, jars and cans. We can also supply vacuum cleaning units as separate machines or combined with fillers.

AUTOMATIC CAPPING

Any type of turn-on closure, of either metal or molded construction, can be automatically applied by a Pneumatic built capper. Caps are sorted, fed and applied to the exact tension desired. Fully automatic operation at speeds ranging from 20 to 120 per minute.

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Bottles, jars, cans, boxes, etc., can be labeled best on one of the dozen or more labeling units included in the Pneumatic line of equipment. Low speed and hi-speed models to suit every labeling need.

COMPLETE SERVICE

More than 80 standard machines for every packaging, bottling and labeling requirement justifies our claim of complete service.

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If You Sell—

**Raw Materials, Machinery, Equipment or Finished Products
to Manufacturers of Soaps, Disinfectants, Insecticides, etc.,
You Should File Your Condensed Catalog Annually in the**

SOAP BLUE BOOK

The average supply house publishes a price list or catalog once a year or in some cases every few months, going to considerable expense to place before possible buyers full details on materials, containers or equipment offered. These catalogs fill an important need, but it is obvious that they have limitations. The buyer cannot keep a complete file of the catalogs of several hundred possible suppliers, so most of them eventually find their way to the waste basket.

A far more efficient way of keeping your catalog before the potential buyer is to file it in condensed form, along with those of other supply houses, in a single volume which will be kept in constant use. This method, more efficient for the seller, is also preferred by the buyer because he can secure information by consulting one book rather than fifty. The SOAP BLUE BOOK is kept in constant use. Besides serving as a complete and efficient buyer's guide, it contains other essential information to which the user must constantly refer.

Your catalog will regularly be brought to the attention of potential buyers if it is filed in the SOAP BLUE BOOK.

Published by

MacNair Dorland Company

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NEW YORK CITY

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REG. U.S. PAT. OFF

Pyrethrum Products Freedom From Extract Troubles

Many insecticide manufacturers have run into serious difficulties as a result of using the wrong type of pyrethrum extract. Here are some of them:

- (a) Separation and Sedimentation.
- (b) Cumulative deterioration.
- (c) Excess solids not soluble in kerosene, which greatly increase the risk of staining.
- (d) Wrong color.
- (e) Complications in perfuming due to precipitation of colloidal or soluble material.
- (f) Non-uniformity as a result of theoretical standardization instead of actual standardization.
- (g) Possible mild toxicity to humans and animals from residual primary solvent.

You can escape these difficulties by using standardized and stabilized POWCO BRAND Basic Pyrethrum Extracts.

When you buy POWCO BRAND Pyrethrum Products, you are certain to receive products which are correctly manufactured to make them both dependable and safe, and of definite, standardized high killing power.

"Killing Power — That's the Thing"

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Specialists in Pyrethrum Products

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POWCO

BRAND

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NEUTRAL POWDERED SOAPS

For Dentifrices

Every experienced manufacturer who has worked with **dentifrices** knows that there is many a slip between the mixing of his finished product and its use weeks later.

Specific cases have shown that too often the trouble can be traced to the use of a soap which is chemically or physically at variance with some characteristic of a particular dentifrice formula.

The exacting buyer must consider the following points in choosing the proper type of soap:—

Color; taste; moisture content; mesh; titre; free sodium carbonate; alcohol residue; water residue and iodine value. In addition of course, the soap must contain no free alkali.

POWCO BRAND Neutral Powdered Soaps offer you this selective buying basis. Convince yourself as so many other manufacturers have done.

MAY WE SEND SAMPLES?

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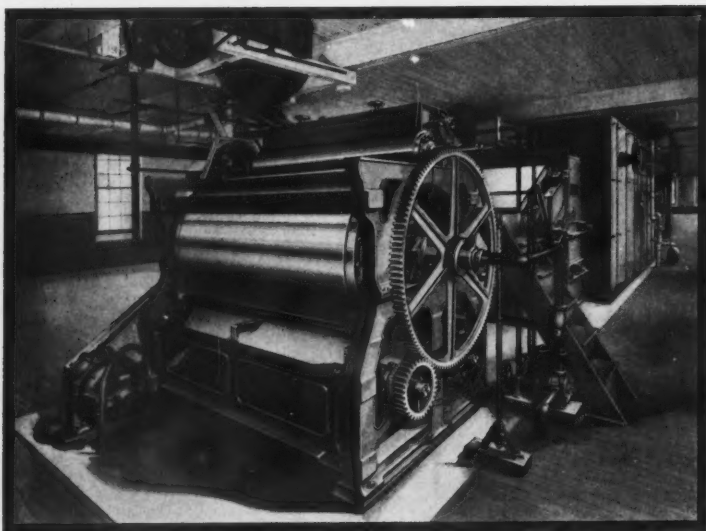
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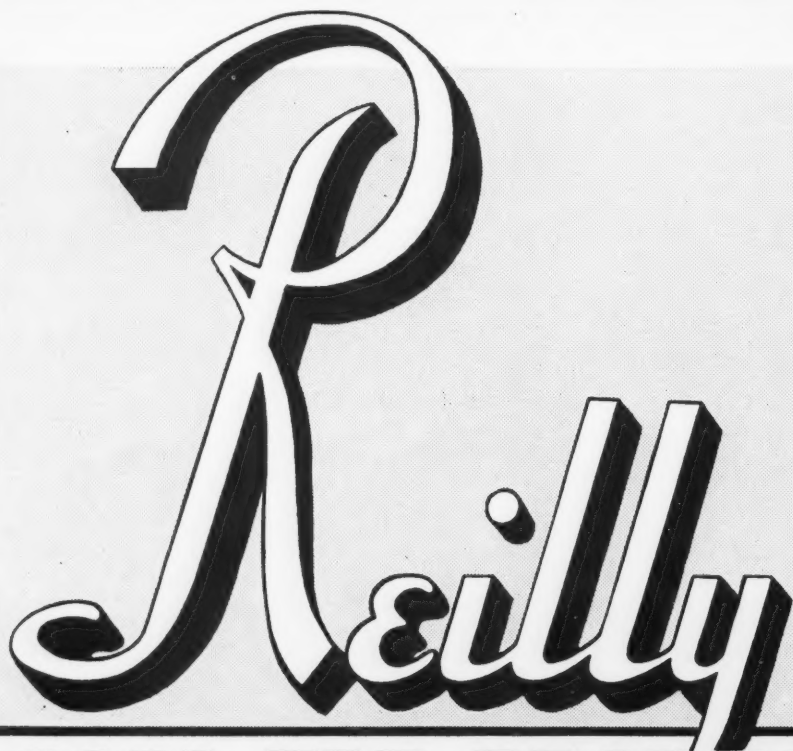
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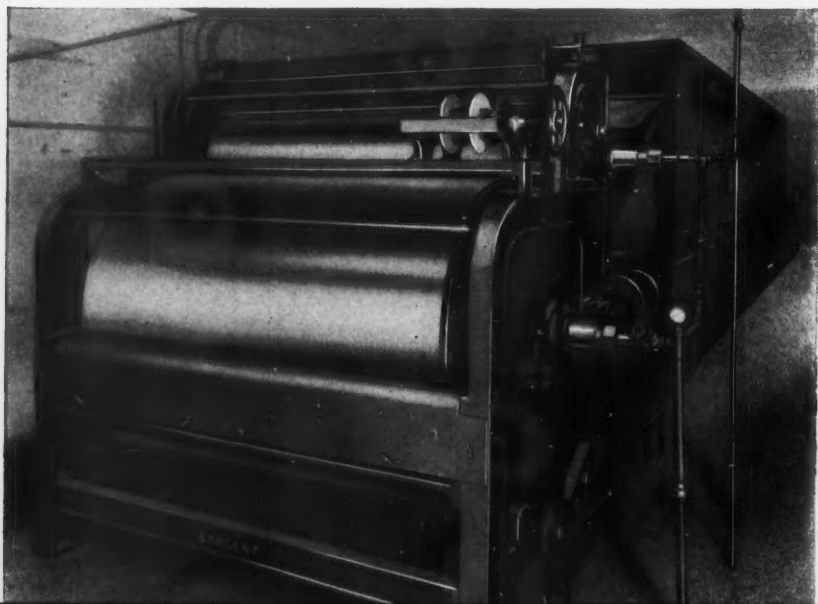
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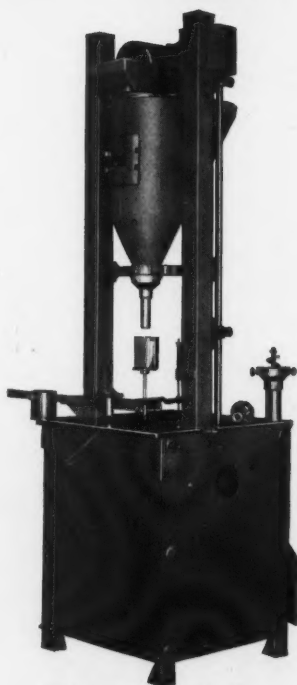
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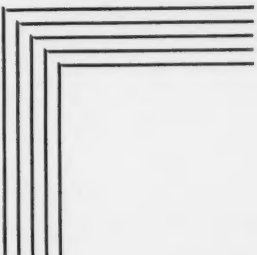
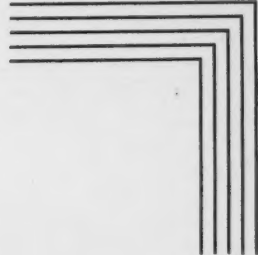
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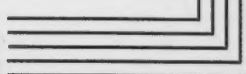
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Above: New "Campbell Turntable" Testing Equipment in the McCormick Laboratories for making comparative tests of liquid insecticides. Tests are being made to establish the relationship between the "Campbell Turntable" method and the "Peet-Grady" method.

Below: "Peet-Grady" method Death-House in the McCormick laboratories for making comparative tests of liquid insecticides. Flies are scientifically raised for testing purposes in a special insectary in the laboratory.



Below: Analytical section of the McCormick laboratories, where, among other daily tests of insecticides, chemical assay of pyrethrum flowers is made by the Gnadinger and Corl and the H. A. Siel methods.



The Most Complete Testing Laboratories in the Insecticide Industry

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and Allied Industries

for 1936



A buying directory showing sources of supply for raw materials, machinery, equipment, etc. used by manufacturers of soaps, disinfectants, insecticides and allied products — also Bulk Suppliers.

ABRASIVES, see PUMICE STONE, SILICA, ETC.**ACETONE***(see also Dealers)*

Carbide & Carbon Chemicals Corp.,
30 E. 42nd St., N.Y.
Cliffs-Dow Chemical Co., Marquette, Mich.
Commercial Solvents Corp., 230 Park Ave., N.Y.
Wm. S. Gray & Co., 342 Madison Ave., N.Y.
R. W. Greeff & Co., 10 E. 40th St., N.Y.
U. S. Industrial Chem. Co., 60 E. 42nd St.,
N.Y.

ACIDS (Sulfuric, Muriatic, Nitric, Acetic, Etc.)*(see also Dealers)*

American Cyanamid & Chem. Corp.,
30 Rockefeller Plaza, N.Y.
Dow Chemical Co., Midland, Mich., See page 25.
E. I. Du Pont de Nemours & Co.,
Wilmington, Del.
General Chemical Co., 40 Rector St., N.Y.
See page 31.
Grasselli Chemical Co., 1300 Guardian Bldg.,
Cleveland See page 35.
Hooker Electrochemical Co., 60 E. 42nd St.,
N.Y. See page 36.
Innis, Speiden & Co., 117 Liberty St., N.Y.
See page 40.
Monsanto Chemical Works, 1724 S. 2nd St.,
St. Louis
Rohm & Haas Co., Inc.,
222 W. Washington Sq., Phila.,
See pages 58, 59.
Stauffer Chem. Co., 420 Lexington Ave., N.Y.
Victor Chemical Wks., 141 W. Jackson Blvd.,
Chicago

ADHESIVES

Arabul Mfg. Co., 110 E. 42nd St., N.Y.
Armour Glue Wks., 1355 W. 31st St., Chicago
C. W. Campbell Co., 157 Chambers St., N.Y.
Dennison Mfg. Co., Framingham, Mass.
W. H. Gage Glue Co., 19 S. Main St., St. Louis
Grasselli Chemical Co., 1300 Guardian Bldg.,
Cleveland See page 35.
Hull Co., 305 Washington St., Brooklyn
Mechling Bros. Chemical Co., Camden, N. J.
National Adhesives Corp., 822 Greenwich St.,
N.Y.
Philadelphia Quartz Co., 121 S. 3rd St., Phila.
Sanford Mfg. Co., W. Congress & Peoria St.,
Chicago
Staley Sales Corp., Decatur, Ill.
Standard Silicate Co., Bond Hill, Cincinnati
Stein, Hall & Co., 285 Madison Ave., N.Y.

AGITATORS

Alsop Engineering Corp., 39 W. 60th St., N.Y.
See pages 6, 7.
Beach-Russ Co., 50 Church St., N.Y.
Consolidated Prods. Co., 15 Park Row, N.Y.
(Used) See page 21.
J. H. Day Co., 1144 Harrison Ave., Cincinnati
Ertel Engineering Corp., 120 E. 16th St., N.Y.
See page 27.
Foster Pump Works, 50 Washington St., Bklyn.
Houchin Machinery Co., Hawthorne, N. J.
See page 37.

Huber Machine Co., 259 46th St., Brooklyn
See page 38.

J. M. Lehmann Co., 248 W. Broadway, N.Y.
Littleford Bros., 443 E. Pearl St., Cincinnati
Mixing Equipment Co., Inc., 1024 Garson Ave.,
Rochester, N. Y.

Newman Tallow & Soap Machy. Co.,
1051 W. 35th St., Chicago (Used)
See page 45.

Patterson Foundry & Machy. Co.,
East Liverpool, Ohio
Scientific Filter Co., 1 Franklin Sq., N.Y.
Sowers Mfg. Co., 1296 Niagara St., Buffalo
Stein-Brill Corp., 183 Varick St., N.Y.
(New & Used) See page 65.
Struthers-Wells Co., Warren, Pa.

AGRICULTURAL INSECTICIDES

American Cyanamid & Chem. Corp.,
30 Rockefeller Plaza, N.Y.
Ansbacher-Siegle Corp., Rosebank, S. I.
Bowker Chemical Co., 50 Church St., N.Y.
California Spray Chemical Corp.,
15 Shattuck Sq., Berkeley, Calif.
Chipman Chemical Co., Bound Brook, N. J.
James Good, Inc., Kensington, Phila.,
See page 34.
Grasselli Chemical Co., Guardian Bldg.,
Cleveland See page 35.
Jungmann & Co., 157 Chambers St., N.Y.
See inside back cover.
McLaughlin, Gormley King Co.,
1715—5th St., S. E., Minneapolis
Mechling Bros. Chemical Co., Camden, N. J.
Sherwin-Williams Co., 292 Madison Ave., N.Y.

AGRICULTURAL INSECTICIDE SPREADERS

American Cyanamid & Chem. Corp.,
30 Rockefeller Plaza, N.Y.
Ansbacher-Siegle Corp., Rosebank, S. I.
Kay-Fries Chemicals, Inc., 180 Madison Ave.,
N.Y. See page 9.

AIR COMPRESSORS (see COMPRESSORS, AIR)**ALCOHOL (Ethyl and Denatured)**
(see also Dealers)

American Coml. Alcohol Corp.,
405 Lexington Ave., N.Y.
American Solvents & Chem. Corp.,
285 Madison Ave., N.Y.
Carbide & Carbon Chemicals Corp.,
30 E. 42nd St., N.Y.
Commercial Solvents Corp., 230 Park Ave.,
N.Y.
Industrial Chem. Sales Co., Inc.,
230 Park Ave., N.Y.
Pennsylvania Sugar Co., 139 S. 3rd St., Phila.
Publicker Coml. Alcohol Co., 260 S. Broad St.,
Phila.
U. S. Industrial Alcohol Co.,
60 E. 42nd St., N.Y.

ALCOHOL (Methyl or Wood)*(see also Dealers)*

Carbide & Carbon Chemicals Corp.,
30 E. 42nd St., N.Y.
Cliffs-Dow Chemical Co., Marquette, Mich.

ALCOHOL (Methyl or Wood) (Cont'd)

Commercial Solvents Corp., 230 Park Ave.,
N.Y.

E. I. Du Pont de Nemours & Co.,
Wilmington, Del.

Innis, Speiden & Co., 117 Liberty St., N.Y.
See page 40.

Industrial Chem. Sales Co., 230 Park Ave., N.Y.

U. S. Industrial Alcohol Co.,
60 E. 42nd St., N.Y.

Wood Products Co., Buffalo, N.Y.

E. I. Du Pont de Nemours & Co.,
Wilmington, Del.

General Chemical Co., 40 Rector St., N.Y.

See page 31.

Grasselli Chemical Co., 1300 Guardian Bldg.,
Cleveland

See page 35.

Mathieson Alkali Works, 60 E. 42nd St., N.Y.

Rohm & Haas Co., Inc.,
222 W. Washington Sq., Phila.,

See pages 58, 59.

ALKALIES, see CAUSTIC SODA, SODA ASH, CAUSTIC POTASH, ETC.**ALUMINUM FOIL**

Aluminum Co. of America, Gulf Bldg.,
Pittsburgh

ALUMINUM STEARATE (see STEARATES)**ALUMS**

(see also Dealers)

Aluminum Co. of America, Gulf Bldg.,
Pittsburgh.

American Cyanamid & Chem. Corp.,
30 Rockefeller Plaza, N.Y.

Armour Ammonia Wks., 1355 W. 31st St.,
Chicago

E. I. Du Pont de Nemours & Co.,
Wilmington, Del.

General Chemical Co., 40 Rector St., N.Y.

See page 31.

Grasselli Chemical Co., 1300 Guardian Bldg.,
Cleveland

See page 35.

Harshaw Chemical Co., 1945 E. 97th St.,
Cleveland

Innis, Speiden & Co., 117 Liberty St., N.Y.

See page 40.

Paper Makers Chem. Corp., Kalamazoo, Mich.

Rohm & Haas Co., Inc.,
222 W. Washington Sq., Phila.,

See pages 58, 59.

Stauffer Chem. Co., 420 Lexington Ave., N.Y.

AMALGAMATORS

Consolidated Prods. Co., 15 Park Row, N.Y.

(Used) See page 21.

Houchin Machinery Co., Hawthorne, N. J.

See page 37.

Huber Mach. Co., 259—46th St., Brooklyn

See page 38.

J. M. Lehmann Co., 248 West B'way, N.Y.

Newman Tallow & Soap Machy. Co.,

1051 W. 35th St., Chicago (Used)

See page 45.

Stein-Brill Corp., 183 Varick St., N.Y.

(New & Used) See page 65.

AMMONIA WATER

(see also Dealers)

American Cyanamid & Chem. Corp.,
30 Rockefeller Plaza, N.Y.

Barrett Co., 40 Rector St., N.Y. See page 16.

Henry W. Bower Chemical Co., Phila.

Bowker Chem. Co., 50 Church St., N.Y.

AMMONIUM BI-FLUORIDE

(see also Dealers)

American Cyanamid & Chem. Corp.,
30 Rockefeller Plaza, N.Y.

American Fluoride Corp., 151 W. 19th St., N.Y.

E. I. Du Pont de Nemours & Co.,
Wilmington, Del.

Harshaw Chemical Co., 1945 E. 97th St.,
Cleveland

Innis, Speiden & Co., 117 Liberty St., N.Y.

See page 40.

Jungmann & Co., 157 Chambers St., N.Y.

See inside back cover.

Merck & Co., Rahway, N. J.

Pfaltz & Bauer, Inc., 300 Pearl St., N.Y.

AMMONIUM CARBONATE

(see also Dealers)

American-British Chem. Supplies, Inc.,
180 Madison Ave., N.Y.

See page 9.

American Cyanamid & Chem. Corp.,
30 Rockefeller Plaza, N.Y.

E. I. Du Pont de Nemours & Co.,
Wilmington, Del.

Innis, Speiden & Co., 117 Liberty St., N.Y.

See page 40.

Jungmann & Co., 157 Chambers St., N.Y.

See inside back cover.

AMMONIUM PERSULFATE (see POTASSIUM PERSULFATE)**AMYL CINNAMIC ALDEHYDE (see AROMATIC CHEMICALS)****AMYL SALICYLATE (see AROMATIC CHEMICALS)****ANIMAL DIPS (see CATTLE DIPS)****ANISE OIL (see ESSENTIAL OILS)****ANISIC ALDEHYDE (see AROMATIC CHEMICALS)****ANT POISONS**

Geo. H. Conn Co., Freeport, Ill.

Lethelin Products Co., Manhasset, N.Y.

Maywood Pest Exterminators, 1206 S. 1st Ave.,
Maywood, Ill.

John Opitz, Inc., 50-14—39th St.,

Long Island City, N.Y.

Ore & Chemical Corp., 80 Broad St., N.Y.

Soilicide Labs., 8 Laurel Pl., Upper Montclair,
N. J.

AROMATIC CHEMICALS (for perfuming)

- Allondon, S. A., 246 Pearl St., N.Y.
American-British Chem. Supplies, Inc.,
 180 Madison Ave., N.Y. See page 9.
van Ameringen-Haebler, Inc.,
 315-4th Ave., N.Y. See pages 10, 11
Aromatic Products, Inc., 15 E. 30th St., N.Y.
 See page 13.
Arthur Bennett, Inc., 109 W. Austin Ave.,
 Chicago
Ph. Chaley, Inc., 200 Varick St., N.Y.
Antoine Chiris Co., 147 Waverly Pl., N.Y.
Compagnie Parento, Inc.,
 Croton-on-Hudson, N.Y.
Dodge & Olcott Co., 180 Varick St., N.Y.
Dow Chemical Co., Midland, Mich., See page 25.
P. R. Dreyer Inc., 12 E. 12th St., N.Y.
A. C. Drury & Co., 219 East North Water St.,
 Chicago, Ill.
E. I. du Pont de Nemours & Co., Inc.,
 Wilmington, Del. See page facing page 1.
Felton Chemical Co., 603 Johnson Ave., Bklyn.
 See page 29.
Chas. Fischbeck Co., 119 W. 19th St., N.Y.
Benj. French, Inc., 160-5th Ave., N.Y.
Fritzsche Brothers, Inc., 76-9th Ave., N.Y.
General Drug Co., 170 Varick St., N.Y.
Givaudan-Delawanna, Inc., 80-5th Ave., N.Y.
 See inside front cover, 33.
Arthur Henriksen, 30 Irving Pl., N.Y.
Industrial Organics, Inc., 151 W. 25th St., N.Y.
C. E. Ising Corp., Flushing, L. I., N.Y.
Kay-Fries Chemicals, Inc.,
 180 Madison Ave., N.Y. See page 9.
Pierre Lemoine, Inc., 62 Watts St., N.Y.
Geo. Lueders & Co., 427 Washington St., N.Y.
Magnus, Mabce & Reynard, 32 Cliff St., N.Y.
A. Maschmeijer, Jr., Inc., 43 West 16th St., N.Y.
Monsanto Chemical Works, 1724 S. 2nd St.,
 St. Louis
Naugatuck Chem. Co., 1790 Broadway, N.Y.
Neumann-Buslee & Wolfe, 224 W. Huron St.,
 Chicago
Norda, Inc., 601 W. 26th St., N. Y.
Northwestern Chemical Co., Wauwatosa, Wis.
Orbis Products Corp., 215 Pearl St., N.Y.
 See page 4.
Pfaltz & Bauer, Inc., 300 Pearl St., N.Y.
Polak's Frutal Wks., Inc., 350 W. 31st St., N.Y.
Riviera Prods. Co., 215 W. Ohio St.,
 Chicago, Ill.
H. C. Ryland, Inc., 161 Water St., N.Y.
Schimmel & Co., 601 W. 26th St., N.Y.
Edwin Seebach Co., 912 Broadway, N.Y.
Wm. G. Sibbach & Co., 201 S. 2nd Ave.,
 Maywood, Ill.
George Silver Import Co., 353-4th Ave., N.Y.
Synfleur Scientific Labs., Monticello, N.Y.
A. M. Todd Co., Kalamazoo, Mich.
Trubek Labs., East Rutherford, N. J.
Ungerer & Co., 13 W. 20th St., N.Y.
 See page facing inside front cover, 68.
Van Dyk & Co., 57 Wilkinson Ave.,
 Jersey City, N. J.
Albert Verley, Inc., 11 E. Astuin Ave., Chicago
 See page 69.

**ARSENATE OF LEAD (see LEAD
ARSENATE)****ARSENICAL DIPS**

- Baird & McGuire, Inc.,** Holbrook, Mass.
 See pages 14, 15.
Wm. Cooper & Nephews, 1909 Clifton Ave.,
 Chicago
General Chemical Co., 40 Rector St., N.Y.
 See page 31.
James Good, Inc., Kensington, Phila.
 See page 34.
Kemiko Mfg. Co., 191 Murray St., Newark,
 N. J.
Koppers Products Co., Koppers Bldg.,
 Pittsburgh
McLaughlin, Gormley King Co., Minneapolis
White Tar Co., Kearney, N. J.

ARSENIC

- American Cyanamid & Chem. Corp.,**
 30 Rockefeller Plaza, N.Y.
American Smelting & Refining Co.,
 120 Broadway, N.Y.
Charles Hardy, Inc., 415 Lexington Ave., N.Y.
Harshaw Chemical Co., Cleveland
Innis, Speiden & Co., 117 Liberty St., N.Y.
 See page 40.
Pfaltz & Bauer, Inc., 300 Pearl St., N.Y.

AUTO SOAPS

- Antiseptol Co.,** 5524 Northwest Highway,
 Chicago
Armour Soap Wks., 1355 W. 31st St., Chicago
 See page 12.
Baums Castorine Co., 200 Mathew St.,
 Rome, N.Y.
Chicago Sanitary Prods. Co.,
 2526 W. Congress St., Chicago
Clifton Chemical Co., 247 Front St., N.Y.
 See page 19.
James Counts Soap Co., 2nd & Washington
 Aves, St. Louis, Mo.
Davies Young Soap Co., Dayton, Ohio
 See page 23.
Diamond Soap Co., 1 Lowden St.,
 Elizabeth, N. J.
Eagle Soap Corp., Huntington, Ind.
 See page 26.
J. Eavenson & Sons, Del. & Penn. Sts.,
 Camden, N. J.
Fuld Bros., 2308 Frederick Ave., Baltimore
 See page 30.
Geneske Bros., W. 48th Pl. & Whipple St.,
 Chicago, Ill.
James Good, Inc., Kensington, Phila.
 See page 34.
Harley Soap Co., 2832 E. Pacific St., Phila.
Hockwald Chemical Co., 30 Bluxome St.,
 San Francisco
Jansen Soap & Chemical Co.,
 324 Leavenworth St., San Francisco, Cal.
H. Kohnstamm & Co., 91 Park Pl., N.Y.
Kranich Soap Co., 54 Richards St., Brooklyn
Laurel Soap Mfg. Co., Tioga & Almond Sts.,
 Phila.
Los Angeles Soap Co., Los Angeles, Calif.
Marshall Prods., Inc., 806 N. 1st St., St. Louis
Masury-Young Co., 76 Roland St., Boston
National Soap Co., 357 South 25th St.,
 Tacoma, Washington
North Coast Chem. & Soap Wks.,
 Seattle, Wash.
Palmer Products, Inc., Waukesha, Wis.

AUTO SOAPS (Cont'd)

Paper Makers Chemical Corp.,
Kalamazoo, Mich.
Peck's Prod. Co., 5224 N. 2nd St., St. Louis
Procter & Gamble Co., Cincinnati
Theo. B. Robertson Prods. Co.,
700 W. Division St., Chicago
Royal Soap & Chem. Co., 5111 S. Central Ave.,
Los Angeles
Geo. A. Schmidt Co., 236 W. North Ave., Chgo.
Werner G. Smith Co., 2191 W. 110th St.,
Cleveland
John T. Stanley Co., 640 W. 30th St., N.Y.
Tremco Mfg. Co., 393 East 131st St., Cleveland
U. S. Sanitary Specialties Corp.,
435 S. Western Ave., Chicago
Vliet Soap Co., 638 Monroe St., Brooklyn
Warren Soap Mfg. Co., 51 Waverly St.,
Cambridge, Mass.
Chas. W. Young & Co., Phila.

BAG LINERS

Arkell Safety Bag Co., 10 E. 40th St., N.Y.
Bemis Bro. Bag Co., 603 S. 4th St., St. Louis
Chase Bag Co., 250 W. 57th St., N.Y.
Crepe-Kraft Co., 114 Adams St., Newark, N. J.
Mente & Co., New Orleans, La.
Paper Service Co., Lockland, Cincinnati, O.
St. Regis Paper Co., 60 E. 42nd St., N.Y.

BAGS (Cloth)

Bemis Bro. Bag Co., 603 S. 4th St., St. Louis
Central Bag & Burlap Co.,
4513 S. Western Blvd., Chicago
Chase Bag Co., 250 W. 57th St., N.Y.
Dayton Bag & Burlap Co., Dayton, O.
Fulton Bag & Cotton Mills, Atlanta, Ga.
Hammond Bag & Paper Co.,
Wellsburg, W. Va.
Mente & Co., New Orleans, La.
Paper Service Co., Lockland, Cincinnati
Premier Bag Co., 157 South St., N.Y.

BAGS (Paper)

Arkell Safety Bag Co., 10 E. 40th St., N.Y.
Bemis Bro. Bag Co., 603 S. 4th St., St. Louis
Chase Bag Co., 250 W. 57th St., N.Y.
Crepe-Kraft Co., 114 Adams St., Newark, N. J.
Hammond Bag & Paper Co.,
Wellsburg, W. Va.
Nashua Gummed & Coated Paper Co.,
Nashua, N. H.
Paper Service Co., P. O. Box 107, Lockland,
Cincinnati
St. Regis Paper Co., 60 E. 42nd St., N.Y.
Union Bag & Paper Co., 233 B'way, N.Y.

BAGS (Waterproof)

Bemis Bro. Bag Co., 603 S. 4th St., St. Louis
Chase Bag Co., 250 W. 57th St., N.Y.
Hammond Bag & Paper Co.,
Wellsburg, W. Va.
Paper Service Co., P. O. Box 107, Lockland,
Cincinnati
St. Regis Paper Co., 60 E. 42nd St., N.Y.

BALSAMS

van Ameringen-Haebler, Inc.,
315—4th Ave., N.Y. See pages 10, 11.
Antoine Chiris Co., 147 Waverly Pl., N.Y.

Aromatic Products, Inc., 15 E. 30th St., N.Y.

See page 13.

Dodge & Olcott Co., 180 Varick St., N.Y.
P. R. Dreyer Inc., 12 E. 12th St., N.Y.
A. C. Drury & Co., 219 East North Water St.,
Chicago
Fritzsch Brothers, Inc., 76—9th Ave., N.Y.
Geo. Lueders & Co., 427 Washington St., N.Y.
Magnus, Mabee & Reynard, 32 Cliff St., N.Y.
Orbis Products Corp., 215 Pearl St., N.Y.

See page 4.

S. B. Penick & Co., 132 Nassau St., N.Y.

See page 47.

H. C. Ryland, Inc., 161 Water St., N.Y.

Ungerer & Co., 13 W. 20th St., N.Y.

See page facing inside front cover, 68.

Albert Verley, Inc., 11 E. Austin Ave., Chicago

See page 69.

BARIUM CARBONATE

Alton Barium Prods. Co., Alton, Ill.
American Cyanamid & Chem. Corp.,
30 Rockefeller Plaza, N.Y.
Fezandie & Sperrle, 205 Fulton St., N.Y.
Grasselli Chemical Co., 1300 Guardian Bldg.,
Cleveland See page 35.
Harshaw Chemical Co.,
1945 E. 97th St., Cleveland
Hummel Chem. Co., 90 West St., N.Y.
Innis, Speiden & Co., 117 Liberty St., N.Y.
See page 40.

Merck & Co., Rahway, N. J.

Wishnick-Tumpeier, Inc., 295 Madison Ave.,
N.Y.

BARREL LINERS

Arkell Safety Bag Co., 10 E. 40th St., N.Y.
Bemis Bro. Bag Co., 603 S. 4th St., St. Louis
Chase Bag Co., 250 W. 57th St., N.Y.
Crepe-Kraft Co., 114 Adams St., Newark, N. J.
Paper Service Co., P. O. Box 107, Lockland,
Cincinnati

BARRELS (Fibre)

Carpenter Container Co., 147—41st St., Bklyn.
Champion Container Co., Water & Morris Sts.,
Philadelphia
Container Co., Van Wert, O.
Diamond State Fibre Co., Bridgeport, Pa.
Master Package Corp., Owen, Wisc.
Rogers Fibre Co., 210 Lincoln St., Boston
Seymour & Peck Co., (Plywood)
917 W. 29th St., Chicago
Spaulding Fibre Co., Rochester, N. H.

BARRELS (Steel)

American Cooperage Co., Maurer, N.J.
American Steel Package Co., Defiance, O.
Draper Mfg. Co., Cleveland, O.
Fetter Steel Barrel Corp., Buffalo
Globe Steel Barrel Co., Cleveland
Manion Steel Barrel Co., Rouseville, Pa.
Meurer Steel Barrel Co., 105 Avenue L.,
Newark, N. J.
Niles Steel Prod. Co., 465 Walnut St.,
Niles, Ohio
Petroleum Iron Works Co., Sharon, Pa.
Pittsburgh Can Co., Pittsburgh
Pressed Steel Tank Co., Milwaukee, Wis.
Republic Steel Package Co., 7930 Jones Rd.,
Cleveland

BARRELS (Steel) (Cont'd)

St. Louis Steel Package Co., St. Louis, Mo.
 John Trageser Steam Copper Works,
 Grand Ave., Maspeth, L. I., N.Y.
 Wackman Welded Ware Co., 7th & Victor Sts.,
 St. Louis
 Wheeling Corrugating Co., Wheeling, W. Va.
 Wilson & Bennett Mfg. Co.,
 6532 S. Menard St., Chicago

BARRELS (Used Steel)

American Cooperage Co., Maurer, N.J.
 Newark Steel Drum Co., Linden, N. J.
Newman Tallow & Soap Machinery Co.,
 1051 W. 35th St., Chicago See page 45.
 Snow & Cleaver, Inc., 15 William St., N.Y.
 See page facing 3rd cover.

BARRELS (Wooden)

Allied Barrel Co., Oil City, Pa.
 American Barrel Co., 205 Bridge St.,
 Salem, Mass.
 American Cooperage Co., Maurer, N.J.
 Atlantic Tank & Barrel Corp.,
 North Bergen, N. J.
 Colwell Cooperage Co., 245 Broadway, N.Y.
 J. D. Hollingshead Co., 612 N. Michigan Ave.,
 Chicago
 Louisville Cooperage Co., Louisville, Ky.
 Michel Cooperage Co., Sandusky, O.
 Weinrick Cooperage Co., Burlington, Iowa
 Western Cooperage Co., Portland, Oregon

BARREL TILTERS

Economy Eng. Co., 2651 W. Van Buren St.,
 Chicago
 Schwenck Safety Device Corp.,
 80 Broad St., N.Y.

BATH SALT COLORS

(see also *Essential Oils*)

A. C. Drury & Co., 219 East North Water St.,
 Chicago
 Fezandie & Sperrle, 205 Fulton St., N.Y.
 Interstate Color Co., 5 Beckman St., N.Y.
 H. Kohnstamm & Co., 91 Park Pl., N.Y.
Pylam Products Co., 799 Greenwich St., N.Y.
 See page 55.
 Sandoz Chem. Wks. Inc., 61 Van Dam St., N.Y.

BATH SALTS

Eagle Soap Corp., Huntington, Ind.
 See page 26.
 Jansen Soap & Chemical Co.,
 324 Leavenworth St., San Francisco, Cal.
 Lightfoot-Schultz Co., 1412 Park Ave.,
 Hoboken, N. J.
 Geo. A. Schmidt Co., 236 W. North Ave., Chgo.
Solvay Sales Corp., 40 Rector St., N.Y.
 (Unperfumed) See pages 62, 63.
 Allen B. Wrisley Co., 6801 W. 65th St., Chicago
 Hoboken, N. J.

BAY OIL (see ESSENTIAL OILS)**BAY RUM**

P. R. Dreyer Inc., 12 E. 12th St., N.Y.
 A. C. Drury & Co., 219 East North Water St.,
 Chicago

Givaudan-Delawanna, Inc., 80—5th Ave., N.Y.

See inside front cover, 33.

Chas. L. Huisking & Co., 155 Varick St., N.Y.
 Lanman & Kemp-Barclay Co.,
 135 Water St., N.Y.

McKesson & Robbins, 79 Cliff St., N.Y.

Norda, Inc., 601 W. 26th St., N.Y.

Ungerer & Co., 13 W. 20th St., N.Y.

See page facing inside front cover, 68.

BEEES WAX

American Cyanamid & Chem. Corp.,
 30 Rocketteller Plaza, N.Y.
 Balfour, Guthrie & Co., Ltd. 67 Wall St., N.Y.
 Cantol Wax Co., Bloomington, Ind.
 T. G. Cooper & Co., 47 N. 2nd St., Phila.
 William H. Dey & Co., 11 Water St., N.Y.
 A. C. Drury & Co., 219 East North Water St.,
 Chicago

Innis, Speiden & Co., 117 Liberty St., N.Y.

See page 40.

Koster-Keunen, Sayville, L. I., N.Y.
 Theodore Leonhard Wax Co., Haledon,
 Paterson, N. J.

Muench-Kreuzer Candle Co., Syracuse, N.Y.

Neumann-Buslee & Wolfe, 224 W. Huron St.,
 Chicago

Orbis Products Corp., 215 Pearl St., N.Y.

See page 4.

S. B. Penick & Co., 132 Nassau St., N.Y.

See page 47.

Frank G. Ross Co., 79 Wall St., N.Y.

L. A. Salomon & Bro., 216 Pearl St., N.Y.

Strohmeier & Arpe Co., 139 Franklin St., N.Y.

Will & Baumer Candle Co., Syracuse, N.Y.

BELLOWS, INSECT POWDER

AcmeLine, Inc., Traverse City, Mich.
 Electric Sprayit Co., 226 N. Broadway,
 Milwaukee, Wisc.
 Feeny Mfg. Co., Muncie, Ind.
Getz Exterminators, Inc., 1139 Pine St.,
St. Louis See page 32.
 Thomas W. Houchin Co., 9-15 McPherson Pl.,
 Jersey City, N. J.
 Lowell Sprayer Co., Lowell, Mich.
 Sefton Fibre Can Co., 3275 Big Bend Blvd.,
 St. Louis

BENTONITE

American Colloid Co., 363 W. Superior St.,
 Chicago
 American Cyanamid & Chem. Corp.,
 30 Rockefeller Plaza, N.Y.
 Chas. B. Chrystal Co., 11 Park Pl., N.Y.
 Hammill & Gillespie, 225 Broadway, N.Y.
Innis, Speiden & Co., 117 Liberty St., N.Y.
 See page 40.
Jungmann & Co., 157 Chambers St., N.Y.
 See inside back cover.
 National Sales Corp., 31 E. 13th St., Cinn.
 Natural Prods. Co., 307 W. 8th St.,
 Los Angeles
 Owyhee Chemical Products Co.,
 300 W. Adams St., Chicago
 Paper Makers Chemical Corp.,
 Kalamazoo, Mich.
 L. A. Salomon & Bro., 216 Pearl St., N.Y.
 Silica Products Co., 700 Baltimore Ave.,
 Kansas City, Mo.
 Tamms Silica Co., 228 N. La Salle St., Chicago
 Whittaker, Clark & Daniels, 246 Front St., N.Y.
 Wishnick-Tumpeier, Inc., 295 Madison Ave.,
 N.Y.

BENZALDEHYDE

- van Ameringen-Haebler, Inc.,
315—4th Ave., N.Y. See pages 10, 11
Dodge & Olcott Co., 180 Varick St., N.Y.
Dow Chemical Co., Midland, Mich., See page 25.
P. R. Dreyer Inc., 12 E. 12th St., N.Y.
E. I. du Pont de Nemours Co., Inc.,
Wilmington, Del. See page facing page 1.
Felton Chemical Co., 603 Johnson Ave., Bklyn.
See page 29.
Fritzsche Brothers, Inc., 76—9th Ave., N.Y.
Heyden Chem. Co., 50 Union Sq., N.Y.
Givaudan-Delawanna, Inc., 80—5th Ave., N.Y.
See inside front cover, 33.
Magnus, Mabee & Reynard, 32 Cliff St., N.Y.
Monsanto Chemical Works, 1724 S. 2nd St.,
St. Louis
Orbis Products Corp., 215 Pearl St., N.Y.
See page 4.
Solvay Sales Corp., 40 Rector St., N.Y.
See pages 62, 63.
Ungerer & Co., 13 W. 20th St., N.Y.
See page facing inside front cover, 68.
Van Dyk & Co., 57 Wilkinson Ave.,
Jersey City, N. J.
Albert Verley, Inc., 11 E. Austin Ave., Chicago
See page 69.

BENZENE (Benzol)

- Barrett Co., 40 Rector St., N.Y. See page 16.
S. H. Bell Co., 1407 Gulf Bldg., Pittsburgh
Wm. Cooper & Nephews, 1909 Clifton Ave.,
Chicago
Hydrocarbon Products, 117 Liberty St., N.Y.
William E. Jordan & Bro., 2590 Atlantic Ave.,
Brooklyn
Koppers Prods. Co., Koppers Bldg.,
Pittsburgh, Pa.
Neville Co., Pittsburgh

BERGAMOT OIL (see ESSENTIAL OILS)**BLEACHING AGENTS (Chemical)**

- American Cyanamid & Chem. Corp.,
30 Rockefeller Plaza, N.Y.
Buffalo Electro Chem. Co.,
River Rd. & Sawyer Ave., Buffalo, N.Y.
Grasselli Chemical Co., 1300 Guardian Bldg.,
Cleveland See page 35.
Hooker Electrochemical Co.,
60 E. 42nd St., N.Y. See page 36.
Industrial Chem. Sales Co., 230 Park Ave., N.Y.
Innis, Speiden & Co., 117 Liberty St., N.Y.
See page 40.
Jungmann & Co., 157 Chambers St., N.Y.
See inside back cover.
Mathieson Alkali Works, 60 E. 42nd St., N.Y.
Niagara Alkali Co., 9 E. 41st St., N.Y.
See page 46.
Rohm & Haas Co., Inc.,
222 W. Washington Sq., Phila.
See pages 58, 59.
Solvay Sales Corp., 40 Rector St., N.Y.
See pages 62, 63.
Joseph Turner & Co., 500—5th Ave., N.Y.
See page 67.
Warner Chem. Co., Chrysler Bldg., N.Y.
See page 70.

BLEACHING POWDER (Chloride of Lime)

- American Cyanamid & Chem. Corp.,
30 Rockefeller Plaza, N.Y.

- Faesy & Besthoff, Inc., 22 E. 40th St., N.Y.
Grasselli Chemical Co., 1300 Guardian Bldg.,
Cleveland See page 35.
Hooker Electrochemical Co.,
60 E. 42nd St., N.Y. See page 36.
Innis, Speiden & Co., 117 Liberty St., N.Y.
See page 40.
Mathieson Alkali Works, 60 E. 42nd St., N.Y.
Niagara Alkali Co., 9 E. 41st St., N.Y.
See page 46.
Stauffer Chem. Co., 420 Lexington Ave., N.Y.
Joseph Turner & Co., 500—5th Ave., N.Y.
See page 67.

BLOCK HOLDERS (see HOLDERS, DEODORIZING BLOCK)**BLOWERS for POWDER INSECTICIDES (see BELLOWS)****BLOWERS, ELECTRIC (see SPRAYERS, ELECTRIC)****BLUING (see LAUNDRY BLUE)****BOILER COMPOUNDS**

- Bird-Archer Co., 2nd, Bristol & N. American
Sts., Phila.
Chicago Sanitary Prods Co.,
2526 W. Congress St., Chicago
Eagle Soap Corp., Huntington, Ind.
See page 26.
Fuld Bros., 2308 Frederick Ave., Baltimore
See page 30.
Goulard & Olena, Inc., 140 Liberty St., N.Y.
Kemiko Mfg. Co., 191 Murray St., Newark,
N. J.
Palmer Prods. Inc., Waukesha, Wisc.
John Sunshine Chem. Co., 604 W. Lake St.,
Chicago
U. S. Sanitary Specialties Corp.,
435 S. Western Ave., Chicago

BOIS de ROSE OIL (see ESSENTIAL OILS)**BORAX**

- American Cyanamid & Chem. Corp.,
30 Rockefeller Plaza, N.Y.
American Potash & Chem. Corp.,
233 Broadway, N.Y.
Borax Union, 420 Lexington Ave., N.Y.
General Chem. Co., 40 Rector St., N.Y.
See page 31.
Grasselli Chemical Co., 1300 Guardian Bldg.,
Cleveland See page 35.
Harshaw Chemical Co., 1945 E. 97th St.,
Cleveland
Innis, Speiden & Co., 117 Liberty St., N.Y.
See page 40.
Pacific Coast Borax Co., 51 Madison Ave., N.Y.
Paper Makers Chemical Corp.,
Kalamazoo, Mich.
Stauffer Chem. Co., 420 Lexington Ave., N.Y.
Wishnick-Tumpeer, Inc., 295 Madison Ave.,
N.Y.

BOTTLES

- American Bottle Co., Toledo, O.
Anchor Cap & Closure Corp., 22 Queens St.,
Long Island City, N.Y.
Capstan Glass Co., Connellsville, Pa.

BOTTLES (Cont'd)

Graham Glass Co., Evansville, Ind.
 Kimble Glass Co., Vineland, N. J.
 Maryland Glass Corp., Baltimore, Md.
 Millville Bottle Wks., Millville, N. J.
 Owens Illinois Glass Co., Toledo, O.
 F. E. Reed Glass Co., 860 Maple St.,
 Rochester, N.Y.
 Root Glass Co., Terre Haute, Ind.
 Ruth Glass Co., Conshohocken, Pa.
 Tygart Valley Glass Co., Washington, Pa.
 T. C. Wheaton Co., Millville, N. J.

BOTTLE FILLING MACHINERY (see FILLING MACHINERY, BOTTLES)**BOTTLE WASHERS (see WASHING MACHINERY, BOTTLES)****BOX LINERS (see BAG LINERS)****BOXES (Corrugated and/or Fibre)**

Brooklyn Fibre Syndicate,
 Decatur St. & Irving Ave., Brooklyn
 Cambridge Paper Box Co., 196 Broadway,
 Cambridge, Mass.
 Consolidated Paper Co., Monroe, Mich.
 Container Corp. of America,
 111 W. Washington St., Chicago
 Robert Gair Co., 155 E. 44th St., N.Y.
 Hinde & Dauch Paper Co., 215 Decatur St.,
 Sandusky, O.
 Interstate Corrugated Box Co., 75 Front St.,
 Brooklyn
 F. J. Kress Box Co., 2930 Liberty Ave.,
 Pittsburgh
 Owens-Illinois Glass Co., Toledo, O.
 River Raisin Paper Co., Monroe, Mich.

BOXES (Fancy Paper)

Alderman-Fairchild Co., 367 Orchard St.,
 Rochester, N.Y.
 Baxter Paper Co., Brunswick, Maine
 F. N. Burt Co., Ltd., 540 Seneca St.,
 Buffalo, N.Y.
 C. J. Fox Co., 236 Aborn St., Providence, R. I.
 Foxon Paper Co., 230 West Park St.,
 Providence, R. I.
 Robert Gair Co., 155 E. 44th St., N.Y.
 R. R. Heywood, Inc.,
 26th St. & 9th Ave., N.Y.
 R. J. Kittredge Co., 812 W. Superior St.,
 Chicago
 Pictorial Package Co., Aurora, Ill.
 Potomac Lithograph Mfg. Co.,
 Washington, D. C.
 W. C. Ritchie & Co., 400 S. Green St., Chicago
 Robertson Paper Box Co., Montville, Conn.
 Geo. Schmitt & Co., Grand & Florence Sts.,
 Brooklyn
 U. S. Printing & Lithographing Co.,
 Norwood, Cincinnati

BOXES (Fancy Wooden)

Pilliod Cabinet Co., Swanton, O.

BROKERS (Chemicals)

S. H. Bell Co., 1407 Gulf Bldg., Pittsburgh
 Dickerson Co., Drexel Bldg., Phila.
 Otto A. C. Hagen Co., Public Ledger Bldg.,
 Phila.

Chas. L. Huisking & Co., 155 Varick St., N.Y.
 Leo Pasternak, Inc., 110 William St., N.Y.
 George Uhe, Inc., 11 Cliff St., N.Y.

BROKERS (Oils and Fats)

Irving R. Boodv. Co., 99 Wall St., N.Y.
 Davidson Commission Co.,
 175 W. Jackson Blvd., Chicago
 John W. Hall, 327 S. La Salle St., Chicago
 Otto A. C. Hagen Co., Public Ledger Bldg.,
 Phila.
 Hentz & Co., 60 Beaver St., N.Y.
 Chas. Hollingshed Co.,
 Produce Exchange, N.Y.
 Horner Commission Co., 15 William St., N.Y.
 Miller & Co., 2401 Chestnut St., Philadelphia
 Rayner & Stonington, Inc., 79 Wall St., N.Y.
 J. H. Redding Co., 17 Battery Pl., N.Y.

Roesling, Monroe & Co., 99 Wall St., N.Y.
 Snow & Cleaver, Inc., 15 William St., N.Y.
 See page facing 3rd cover.
 Sterne & Son Co., Produce Exchange, N.Y.
 Wm. M. Ware & Co., 88 Broad St., Boston
 H. L. Webster & Co., 111 W. Washington St.,
 Chicago
 Welch, Holme & Clark Co., Inc.,
 563 Greenwich St., N.Y.
 G. A. Wharry & Co., 24 State St., N.Y.
 Wilbur-Ellis Co., 17 Battery Pl., N.Y.

See page 71.

Wilson Brokerage, Inc.,
 Produce Exchange, N.Y.

BROOMS

Alabama Broom & Mattress Co.,
 Huntsville, Ala.
 Burdett-Rose Mfg. Co.,
 6100 Independence Rd., Kansas, Mo.
 Chattanooga Broom & Mop Co.,
 Chattanooga, Tenn.
 Detroit Quality Brush Mfg. Co.,
 5937 Michigan Ave., Detroit
 Eagle Woodenware Co., Hamilton, O.
 Kendallville Brush & Broom Co.,
 Kendallville, Ind.
 Tate Mfg. Co., 67 Sudbury St., Boston, Mass.
 M. J. Toohey & Co., Fall River, Mass.

BRUSHES

American Standard Mfg. Co.,
 2509 Lime St., Chicago
 Auburn Brush Co., Columbia, Pa.
 Burdett-Rose Mfg. Co.,
 6100 Independence Rd., Kansas City, Mo.
 Churchill Mfg. Co., 309 Douglas St.,
 Sioux City, Ia.
 Detroit Quality Brush Mfg. Co.,
 5937 Michigan Ave., Detroit
 Flour City Brush Co., 422 S. 4th t., Minneapolis
 J. I. Holcomb Co., Indianapolis
 Illinois Brush Mfg. Co.,
 3316 Ogden Ave., Chicago
 Jap-Art Brush Co., 154 Nassau St., N.Y.
 (Importers)
 W. E. Kautenberg Co., P. O. Box 255,
 Freeport, Ill.
 Kendallville Brush & Broom Co.,
 Kendallville, Ind.
 Marcus Brush Co., 233 Broadway, N.Y.
 National Brush Co., Aurora, Ill.
 New Jersey Brush Mfg. Co., Newton, N. J.
 Opie Brush Co., Kansas City, Mo.

BRUSHES (Cont'd)

Ox Fibre Brush Co., Frederick, Md.
 Palmer Prods, Inc., Waukesha, Wisc.
 Pioneer Mfg. Co., Cleveland, O.
 Sanitary Mfg. Co., 926 Ft. Wayne Ave.,
 Indianapolis, Ind.
 Silver-Chamberlin Co., Clayton, N. J.
 Sullivan Brush Co., Terre Haute, Ind.
 Tate Mfg. Co., 67 Sudbury St., Boston, Mass.

CAJUPUT OIL (see ESSENTIAL OILS)**CALCIUM STEARATE (see STEARATES)****CAMPBOR OIL, SASSAFRASSY (see ESSENTIAL OILS)****CAMPBOR OIL, WHITE (see ESSENTIAL OILS)****CAN FILLING MACHINERY (see FILLING MACHINERY, CANS)****CANANGA OIL (see ESSENTIAL OILS)****CANDELILLA WAX (see WAXES)****CANS (Decorated Tin)**

American Can Co., 230 Park Ave., N.Y.
 Anchor Cap & Closure Corp., 22 Queen St.,
 Long Island City, N.Y.
 J. L. Clark Mfg. Co., Rockford, Ill.
 Columbia Can Co., 5221 Natural Bridge Ave.,
 St. Louis
Continental Can Co., Inc., 100 E. 42nd St., N.Y.
 See page 22.
 General Can Co., 1603 S. Canal St., Chicago
 Giles Can Co., 2444 W. 16th St., Chicago
 Heekin Can Co., Cincinnati
National Can Co., 110 E. 42nd St., N.Y.
 See page 43.
 Metal Package Corp., 110 E. 42nd St., N.Y.
 W. F. Robertson Steel & Iron Co.,
 Springfield, O.
 St. Louis Can Co., 904 S. 14th St., St. Louis
 Tin Decorating Co., of Baltimore, Baltimore
 Wilkes-Barre Can Co., Kingston, Pa.

CANS (Fibre or Paper)

American Can Co., 230 Park Ave., N.Y.
 Cambridge Paper Box Co., 196 Broadway,
 Cambridge, Mass.
 Canister Co., Phillipsburg, N. J.
 Cin-Made Corp.,
 294 Eggleston Ave., Cincinnati
 Cleveland Container Co., 10630 Berea Rd.,
 Cleveland
 Cross Paper Products Co.,
 2595 Third Ave., N.Y.
 Fonda Container Co., 41 Park Row, N.Y.
 Master Package Corp., Owen, Wisc.
 Midwest Paper Container Co., 707 N. 3rd St.,
 Minneapolis
National Can Co., 110 E. 42nd St., N.Y.
 See page 43.
 National Paper Can Co., Cudahy, Wis.
 R. C. Can Co., 121 Chambers St., St. Louis

W. C. Ritchie & Co., 8855 S. Baltimore Ave.,
 Chicago
 Sefton Fibre Can Co., 3275 Big Bend Blvd.,
 St. Louis

CANS (Plain Tin)

American Can Co., 230 Park Ave., N.Y.
 J. L. Clark Mfg. Co., Rockford, Ill.
 Columbia Can Co., 5221 Natural Bridge Ave.,
 St. Louis
Continental Can Co., Inc., 100 E. 42nd St., N.Y.
 See page 22.
 Fein's Tin Can Co., 284 Furman St., Brooklyn
 General Can Co., 1603 S. Canal St., Chicago
 Giles Can Co., 2444 W. 16th St., Chicago
 Heekin Can Co., Cincinnati
National Can Co., 110 E. 42nd St., N.Y.
 See page 43.
 St. Louis Can Co., 904 S. 14th St., St. Louis
 Tin Decorating Co. of Baltimore, Baltimore

CANS (Sifter Top)

American Can Co., 230 Park Ave., N.Y.
 Anchor Cap & Closure Corp., 22 Queens St.,
 Long Island City, N. Y.
 Cambridge Paper Box Co., 196 Broadway,
 Cambridge, Mass.
 Cleveland Container Co., 10630 Berea Rd.,
 Cleveland
 Cin-Made Corp.,
 294 Eggleston Ave., Cincinnati
Continental Can Co., Inc., 100 E. 42nd St., N.Y.
 See page 22.
 Giles Can Co., 2444 W. 16th St., Chicago
National Can Co., 110 E. 42nd St., N.Y.
 See page 43.
 R. C. Can Co., 121 Chambers St., St. Louis
 Sefton Fibre Can Co., 3275 Big Bend Blvd.,
 St. Louis
 Tin Decorating Co., of Baltimore,
 Boston St. & Linwood Ave., Baltimore, Md.

CANS (Steel)

American Can Co., 230 Park Ave., N.Y.
 Central Can Co., 2415 W. 19th St., Chicago
 Fein's Tin Can Co., 284 Furman St., Brooklyn
 Geuder, Paeschke & Frey Co., Milwaukee
 Niles Steel Prods. Co., 465 Walnut St.,
 Niles, Ohio
 John Trageser Steam Copper Works,
 Grand Ave., Maspeth, L. I., N.Y.
 Vulcan Stamping & Mfg. Co.,
 4036 W. Lake St., Chicago
 Wilson & Bennett Mfg. Co.,
 6532 Menard Ave., Chicago

CAPPING MACHINERY

Alsop Engineering Corp., 39 W. 60th St., N.Y.
 See pages 6, 7.
 Anchor Cap & Closure Corp., 22 Queens St.,
 Long Island City, N.Y.
 Consolidated Packaging Machinery Corp.,
 1400 West Ave., Buffalo, N.Y.
Consolidated Prods. Co., 15 Park Row, N.Y.
 (Used) See page 21.
 R. G. Haskins Co., 4642 W. Fulton St., Chicago
 Karl Kiefer Machine Co., Cincinnati, Ohio
 Ludcke Co., 41 N. Beacon St., Watertown,
 Mass.

CAPPING MACHINERY (Cont'd)

- Newman Tallow & Soap Machy. Co.,
1051 W. 35th St., Chicago (Used)
See page 45.
- Phoenix Metal Cap Co.,
2444 W. 16th St., Chicago
- Pneumatic Scale Corp., Norfolk Downs, Mass.
See pages 48, 49.
- Scientific Filter Co., 1 Franklin Sq., N.Y.
- C. T. Small Development Co., 212 S. 7th St.,
St. Louis
- Stein-Brill Corp., 183 Varick St., N.Y.
(New & Used) See page 65.
- Williams Sealing Corp., Decatur, Ill.

CAPPING MATERIALS

- Du Pont Cellophane Co., 2 Park Ave., N.Y.
- Ferdinand Gutmann & Co.,
Bush Terminal Bldg. #19, Bklyn.
- Sylvania Industrial Corp., Chanin Bldg., N.Y.
- Paul Troeder, Belleville, N. J.

CAPS (Molded)

- Anchor Cap & Closure Corp., 22 Queens St.,
Long Island City, N.Y.
- Armstrong Cork & Insulation Co.,
Lancaster, Pa.
- Bakelite Corp., Bound Brook, N. J.
- General Plastics, Inc., N. Tonawanda, N.Y.
- Owens-Illinois Glass Co., Toledo, O.
- Resinox Corp., Terre Haute, Ind.
- Toledo Synthetic Prods Co., Toledo, O.

CAPS (Metal)

- Aluminum Co. of America, Gulf Bldg.,
Pittsburgh
- Anchor Cap & Closure Corp., 22 Queens St.,
Long Island City, N.Y.
- Armstrong Cork & Insulation Co.,
Lancaster, Pa.
- Closure Service Co., Toledo, O.
- Crown Cork & Seal Co., Eastern Ave. &
Kresson St., Baltimore
- Ferdinand Gutmann & Co.,
14th Ave. & 37th St., Bklyn.
- National Can Co., 110 E. 42nd St., N.Y.
See page 43.
- National Seal Co., 14th Ave. & 37th St., Bklyn.
- Phoenix Metal Cap Co.,
2444 W. 16th St., Chicago
- Tin Decorating Co. of Baltimore,
Boston St. & Linwood Ave., Baltimore, Md.
- Williams Sealing Corp., Decatur, Ill.

CARAWAY OIL (see ESSENTIAL OILS)**CARBOLIC ACID, CRUDE (see TAR ACID)****CARBON BISULFIDE**

(see also Dealers)

- Dow Chemical Co., Midland, Mich., See page 25.
- E. I. Du Pont de Nemours & Co.,
Wilmington, Del.
- Grasselli Chemical Co., 1800 Guardian Bldg.,
Cleveland See page 35.
- Stauffer Chem. Co., 420 Lexington Ave., N.Y.
- Warner Chemical Co., 405 Lexington Ave., N.Y.
See page 70.

CARBON TETRACHLORIDE

(see also Dealers)

- J. T. Baker Chemical Co., Phillipsburg, N. J.
- Brown Co., Portland, Me.
- Dow Chemical Co., Midland, Mich., See page 25.
- E. I. Du Pont de Nemours & Co.,
Wilmington, Del.
- Grasselli Chemical Co., 1800 Guardian Bldg.,
Cleveland See page 35.
- Innis, Speiden & Co., 117 Liberty St., N.Y.
See page 40.
- Niagara Smelting Corp., Niagara Falls, N.Y.
- Stauffer Chem. Co., 420 Lexington Ave., N.Y.
- Warner Chemical Co., 405 Lexington Ave., N.Y.
See page 70.

CARNAUBA WAX (see WAXES)**CARTON LINING MACHINES (see LINING MACHINERY)****CARTON SEALING MACHINERY (see SEALING MACHINERY)****CARTONING MACHINERY**

- Consolidated Prods. Co., 15 Park Row, N.Y.
(Used) See page 21.
- J. L. Ferguson Co., Joliet, Ill.
- Johnson Automatic Sealer Co., Battle Creek,
Mich.
- R. A. Jones & Co., Cincinnati, O.
- Newman Tallow & Soap Machy. Co.,
1051 W. 35th St., Chicago (Used)
See page 45.
- Pneumatic Scale Corp., Norfolk Downs, Mass.
See pages 48, 49.
- F. B. Redington Co., 112 S. Sangamon St.,
Chicago
- Stein-Brill Corp., 183 Varick St., N.Y.
(Used) See page 65.
- Stokes & Smith Co., 65 Summerdale Ave.,
Phila., Pa. See page 66.
- Triangle Package Machinery Co.,
906 N. Spaulding Ave., Chicago

CARTONS (Display and Knock Down)

- Alderman-Fairchild Co., Rochester, N.Y.
- F. N. Burt Co., 540 Seneca St., Buffalo, N.Y.
- Consolidated Paper Co., Monroe, Mich.
- Robert Gair Co., 155 E. 44th St., N.Y.
- Nevins-Church Co., 250 Park Ave., N.Y.
- New England Card & Paper Co.,
Springfield, Mass.
- Pictorial Package Co., Aurora, Ill.
- Randolph Box & Label Co., 843 W. Van
Buren St., Chicago
- W. C. Ritchie & Co., 8855 S. Baltimore Ave.,
Chicago
- Robertson Paper Box Co., Inc., Montville,
Conn.
- George Schmitt & Co., Grand & Florence Sts.,
Bklyn.
- U. S. Printing & Lithographing Co.,
Cincinnati, Q.

CASE SEALING MACHINERY (see SEALING MACHINERY)

CASEIN-

- American Cyanamid & Chem. Corp.,
30 Rockefeller Plaza, N.Y.
Innis, Speiden & Co., 117 Liberty St., N.Y.
See page 40.
Jungmann & Co., 157 Chambers St., N.Y.
See inside back cover.
Land-o-Lakes Creameries, Minneapolis
National Casein Co., 603 W. 80th St., Chicago
Paper Makers Chemical Corp.,
Kalamazoo, Mich.

CASES (Fibre) see **BOXES, CANS (Fibre)**

CASES (Corrugated) see **BOXES**

CASTILE SOAP, BAR, POWDER

- Armour Soap Wks., 1355 W. 31st St., Chicago
See page 12.
Cincinnati Soap Co., Cincinnati
Conti Soap Distributors, 16 Atlantic Ave.,
Brooklyn, N.Y.
Charles L. Huisling, Inc., 155 Varick St., N.Y.
Kranich Soap Co., 54 Richards St., Brooklyn
Leghorn Trading Co., 155 E. 44th St., N.Y.
See page 42.
Lockwood-Brckett Co., Waltham Station,
Boston
Los Angeles Soap Co., Los Angeles, Calif.
Peck's Prods. Co., 522-40 N. 2nd St., St. Louis
Newell Guttradt Co., 350 Fremont St.,
San Francisco, Calif.
Allen B. Wisley Co., 6801 W. 65th St., Chicago

CASTILE SOAP, LIQUID

- Antiseptol Co., 5524 Northwest Highway,
Chicago
Clifton Chemical Co., 247 Front St., N.Y.
See page 19.
Davies-Young Soap Co., Dayton, O.
See page 23.
Eagle Soap Corp., Huntington, Ind.
See page 26.
Fuld Bros., 2308 Frederick Ave., Baltimore
See page 30.
James Good, Inc., Kensington, Phila.
See page 34.
Hunt Mfg. Co., Lisbon Rd., Cleveland
Hysan Products Co., 2560 Armitage Ave.,
Chicago
Kranich Soap Co., 54 Richards St., Brooklyn
Palmer Prods. Inc., Waukesha, Wisc.
Peck's Prods. Co., 522-40 N. 2nd St., St. Louis
Geo. A. Schmidt Co., 236 W. North Ave.,
Chicago
U. S. Sanitary Spec. Corp., 435 S. Western Ave.,
Chicago
Allen B. Wisley Co., 6801 W. 65th St.,
Chicago

CASSIA OIL (see **ESSENTIAL OILS**)

CASTOR OIL

(see also *Dealers*)

- Archer-Daniels-Midland Co., Minneapolis
Baker Castor Oil Co., 120 Broadway, N.Y.

- Balfour, Guthrie & Co., 67 Wall St., N.Y.
T. G. Cooper & Co., 47 N. 2nd St., Phila.
Otto A. C. Hagen Co., 929 Ledger Bldg.,
Phila.
National Oil Products Co., Harrison, N. J.
Spencer Kellogg & Sons, Buffalo, N.Y.
Snow & Cleaver, Inc., 15 William St., N.Y.
See page facing 3rd cover.
Welch, Holme & Clark Co., Inc.,
563 Greenwich St., N.Y.

CATTLE DIPS

(see also *Sheep Dips*)

- An-Fo Mfg. Co., 3129 Elmwood Ave.,
Oakland, Cal.
Baird & McGuire, Holbrook, Mass.
See pages 14, 15.
Chemical Compounding Corp.,
262 Huron St., Bklyn.
Chicago Sanitary Prods. Co.,
2526 W. Congress St., Chicago
Clifton Chem. Co., 247 Front St., N.Y.
See page 19.
Chem. Supply Co., 2450 Canal Rd., Cleveland
Fuld Bros., 2308 Frederick Ave., Baltimore
See page 30.
General Chem. Co., 40 Rector St., N.Y.
See page 31.
Globe Sanitary Supply Co., 2249 E. 38th St.,
Los Angeles
James Good, Inc., Kensington, Phila.
See page 34.
Goulard & Olena, 140 Liberty St., N.Y.
Hockwald Chem. Co., 30 Bluxome St.,
San Francisco
Hunt Mfg. Co., Lisbon Rd., Cleveland
William E. Jordan & Bros., 2590 Atlantic Ave.,
Brooklyn
Kemiko Mfg. Co., 191 Murray St., Newark,
N. J.
Koppers Prods. Co., Koppers Bldg.,
Pittsburgh, Pa.
Marshall Prods., Inc., 806 N. 1st St., St. Louis
McLaughlin, Gormley King Co.,
Minneapolis, Minn.
North Coast Soap & Chem. Wks., Seattle, Wash.
Palmer Prods., Inc., Waukesha, Wis.
Peck's Prod. Co., 522-40 N. 2nd St., St. Louis
Shores Co., Cedar Rapids, Ia.
U. S. Sanitary Specialties Corp.,
435 S. Western Ave., Chicago
Robert C. White Co., Falls of Schuylkill, Phila.
White Tar Co., Kearny, N. J.

CATTLE SPRAY BASE (see **PETROLEUM BASES**)**CATTLE SPRAYS**

- An-Fo Mfg. Co., 3129 Elmwood Ave.,
Oakland, Cal.
Baird & McGuire, Inc., Holbrook, Mass.
See pages 14, 15.
Barrett Co., 40 Rector St., N.Y. See page 16.
Cary Mfg. Co., Joliet, Ill.
Chemical Compounding Corp., 262 Huron St.,
Brooklyn
Chemical Supply Co., 2450 Canal Rd., Cleveland
Chicago Sanitary Prods. Co.,
2526 W. Congress St., Chicago
Churchill Mfg. Co., 309 Douglas St.,
Sioux City, Ia.
Clifton Chem. Co., 247 Front St., N.Y.
See page 19.

CATTLE SPRAYS (Cont'd)

- Geo. H. Conn Co., Freeport, Ill.
 Derris, Inc., 79 Wall St., N.Y. See page 24
 Eagle Soap Corp., Huntington, Ind. See page 26.
 Fuld Bros., 2308 Frederick Ave., Baltimore See page 30.
 Globe Sanitary Supply Co., 2249 E. 38th St., Los Angeles
 James Good, Inc., Kensington, Phila. See page 34.
 Goulard & Olena, 140 Liberty St., N.Y.
 Haag Laboratories, Inc., 6101 S. May St., Chicago
 Dr. Hess & Clark, Inc., Ashland, Ohio
 Hockwald Chem. Co., 30 Bluxome St., San Francisco
 R. M. Hollingshead Co., 840 Cooper St., Camden, N. J.
 K. B. Chemical Co., 276 N. Main St., Providence, R. I.
 Kemiko Mfg. Co., 191 Murray St., Newark, N. J.
 Koppers Prods. Co., Koppers Bldg., Pittsburgh, Pa.
 Mechling Bros. Chemical Co., Line St. & Coopers Creek, Camden, N. J.
 Palmer Products, Inc., Waukesha, Wis.
 Peck's Prod. Co., 522-40 N. 2nd St., St. Louis
 Perrow Chem. Co., Hurt, Va.
 Sherwin-Williams Co., 601 Canal Rd., Cleveland, O.
 Shores Co., Cedar Rapids, Ia.
 U. S. Sanitary Specialties Corp., 435 S. Western Ave., Chicago
 Robert C. White Co., Falls of Schuylkill, Phila.
 White Tar Co., Kearny, N. J.

CAUSTIC POTASH*(see also Dealers)*

- American Cyanamid & Chem. Corp., 30 Rockefeller Plaza, N.Y.
 T. G. Cooper & Co., 47 N. 2nd St., Phila.
 E. I. Du Pont de Nemours & Co., Wilmington, Del.
 Faesey & Besthoff, 22 E. 40th St., N.Y.
 Grasselli Chem. Co., 1300 Guardian Bldg., Cleveland See page 35.
 Innis, Speiden & Co., 117 Liberty St., N.Y. See page 40.
 Niagara Alkali Co., 9 E. 41st St., N.Y. (Mfrs.) See page 46.
 E. M. Sergeant Pulp & Chemical Co., 350—5th Ave., N.Y.
 Solvay Sales Corp., 40 Rector St., N.Y. See pages 62, 63.
 Joseph Turner & Co., 500—5th Ave., N.Y. See page 67.

CAUSTIC SODA*(see also Dealers)*

- American Cyanamid & Chem. Corp., 30 Rockefeller Plaza, N.Y.
 Belle Alkali Co., Belle, W. Va.
 Brown Company, Portland, Me.
 Champion Fibre Co., Canton, N. C.
 Columbia Alkali Co., 30 Rockefeller Plaza., N.Y. See page 20.
 Diamond Alkali Co., First Nat'l Bk. Bldg., Pittsburgh

Dow Chemical Co., Midland, Mich., See page 25.
 Great Western Electrochemical Co., San Francisco

Hooker Electrochemical Co., 60 E. 42nd St., N.Y. See page 36.
 Innis, Speiden & Co., 117 Liberty St., N.Y. See page 40.

Kimberley-Clark Paper Co., Neenah, Wis.
 Mathieson Alkali Works, 60 E. 42nd St., N.Y.
 Michigan Alkali Co., 60 E. 42nd St., N.Y.
 Michigan Electrochemical Co., Menominee, Mich.

Niagara Alkali Co., 9 E. 41st St., N. Y. See page 46.

Niagara Smelting Corp., Niagara Falls, N.Y.
 Oxford Paper Co., White Mountains, N. H.
 Pennsylvania Salt Mfg. Co., Widener Bldg., Phila.
 Solvay Sales Corp., 40 Rector St., N.Y. See pages 62, 63.

Stauffer Chem. Co., 420 Lexington Ave., N.Y.
 Joseph Turner & Co., 500—5th Ave., N.Y. See page 67.

Warner Chemical Co., 405 Lexington Ave., N.Y. See page 70.

CEDAR LEAF OIL (see ESSENTIAL OILS)**CEDARWOOD OIL (see ESSENTIAL OILS)****CERESIN WAX (see WAXES)****CHALK (Calcium Carbonate)**

- American Cyanamid & Chem. Corp., 30 Rockefeller Plaza, N.Y.
 H. J. Baker & Bro., 271 Madison Ave., N.Y.
 Binney & Smith Co., 41 E. 42nd St., N.Y.
 Chas. B. Chrystal Co., 11 Park Pl., N.Y.
 A. C. Drury & Co., 219 East North Water St., Chicago
 Fezandie & Sperrle, 205 Fulton St., N.Y.
 E. Fougera & Co., 41 Maiden Lane, N.Y.
 Goris & Arnstein, 37th & Racine Ave., Chicago
 K. F. Griffiths Co., 110 E. 42nd St., N.Y.
 Hammill & Gillespie, 225 Broadway, N.Y.
 Industrial Chem. Sales Co., 230 Park Ave., N.Y.
 Innis, Speiden & Co., 117 Liberty St., N.Y. See page 40.
 Jungmann & Co., 157 Chambers St., N.Y. See inside back cover.
 L. A. Salomon & Bro., 216 Pearl St., N.Y.
 Tamms Silica Co., 228 N. La Salle St., Chicago
 Wishnick-Tumpeier, Inc., 295 Madison Ave., N.Y.

CHAMOIS

- Addison Sponge Co., 118 E. Court St., Cincinnati
 Allied Industrial Prods. Co., 17 N. Elizabeth St., Chicago
 Amer. Sponge & Chamois Co., 23 Beekman St., N.Y.
 Atlas Sponge Co., 291 Church St., N.Y.
 Great Eastern Sponge & Chamois Co., 833 N. Patt. Pk. Ave., Baltimore
 Jos. Niehaus Co., 341 W. 4th St., Cincinnati
 James H. Rhodes & Co., 157 W. Austin Ave., Chicago
 Schroeder & Tremayne, 500 N. Com'l St., St. Louis

CHILLING ROLLS

- Consolidated Prods. Co., 15 Park Row, N.Y.
(Used) See page 21.
William Garrigue & Co., 9 S. Clinton St.,
Chicago
Houchin Machinery Co., Hawthorne, N. J.
See page 37.
Huber Machine Co., 259—46th St., Brooklyn
See page 38.
J. M. Lehmann Co., 248 W. Broadway, N.Y.
Newman Tallow & Soap Machy. Co.,
1051 W. 35th St., Chicago (Used)
See page 45.
Proctor & Schwartz, 7th St. & Tabor Rd.,
Philadelphia See page 54.
C. G. Sargent's Sons Corp., Graniteville, Mass.
See page 60.
Stein-Brill Corp., 183 Varick St., N.Y.
(Used) See page 65.
F. J. Stokes Machine Co., 5974 E. Tabor Rd.,
Phila.

CHINA CLAY (see CLAYS)**CHIPPERS**

- Consolidated Prods. Co., 15 Park Row, N.Y.
(Used) See page 21.
Houchin Machinery Co., Hawthorne, N. J.
See page 37.
Huber Machine Co., 259—46th St., Brooklyn
See page 38.
J. M. Lehmann Co., 248 W. Broadway, N.Y.
Newman Tallow & Soap Machy. Co.,
1051 W. 35th St., Chicago (Used)
See page 45.
Stein-Brill Corp., 183 Varick St., N.Y.
(Used) See page 65.
Stephens-Adamson Mfg. Co., Aurora, Ill.

CHIP SOAPS (Including Flakes)

- Armour Soap Wks., 1355 W. 31st St., Chicago
See page 12.
Cincinnati Soap Co., 7th & Elm Sts., Cincinnati
Colgate-Palmolive-Peet Co., Jersey City, N. J.
Du Bois Soap Co., Cincinnati, Ohio
Hewitt Soap Co., Dayton, Ohio
Lever Bros. Co., Cambridge, Mass.
Los Angeles Soap Co., Los Angeles, Calif.
Geo. E. Marsh Co., 200 Broadway, Cambridge,
Mass.
National Milling & Chem. Co., Manayunk, Phil.
National Soap Co., 357 South 25th St.,
Tacoma, Wash.
Procter & Gamble Co., Cincinnati
J. T. Robertson Co., 147 Richmond Ave.,
Syracuse, N. Y.
Geo. Schmidt Co., 236 W. North Ave.,
Chicago, Ill.
Swift & Co., Union Stock Yards, Chicago
Warren Soap Mfg. Co., 51 Warren St.,
Cambridge, Mass.
M. Werk Co., Cincinnati
Chas. W. Young & Co., Phila.

CHLORINE

- American Cyanamid & Chem. Corp.,
30 Rockefeller Plaza, N.Y.
Diamond Alkali Co., First Nat'l Bk. Bldg.,
Pittsburgh, Pa.

- Electro Bleaching Gas Co., 9 E. 41st St., N.Y.
See page 46.
Grasselli Chem. Co., 1300 Guardian Bldg.,
Cleveland See page 35.
Hooker Electrochemical Co.
60 E. 42nd St., N.Y. See page 36.
Innis, Speiden & Co., 117 Liberty St., N.Y.
See page 40.
Mathieson Alkali Works, 60 E. 42nd St., N.Y.
Monsanto Chemical Works, 1724 S. 2nd St.,
St. Louis
Niagara Alkali Co., 9 E. 41st St., N.Y.
See page 46.
Pennsylvania Salt Mfg. Co., Widener Bldg.,
Phila.
Solvay Sales Corp., 40 Rector St., N.Y.
See pages 62, 63.
Warner Chemical Co., 405 Lexington Ave., N.Y.
See page 70.

CHLORINE DISINFECTANTS (see DISINFECTANTS)**CHLOROFORM**

- Barrett Co., 40 Rector St., N.Y. See page 16.
Brown Company, Portland, Me.
Dow Chemical Co., Midland, Mich. See page 25.
E. I. Du Pont de Nemours & Co.,
Wilmington, Del.
Grasselli Chem. Co., 1300 Guardian Bldg.,
Cleveland See page 35.
Innis, Speiden & Co., 117 Liberty St., N.Y.
See page 40.
Mallinckrodt Chemical Works, St. Louis, Mo.
Merck & Co., Rahway, N. J.
Niagara Smelting Corp., Niagara Falls, N.Y.
Stauffer Chem. Co., 420 Lexington Ave., N.Y.

CHLOROPHYLL

- Harshaw Chemical Co.,
1945 E. 97th St., Cleveland
Interstate Color Co., 5 Beekman St., N.Y.
Jungmann & Co., 157 Chambers St., N.Y.
See inside back cover.
Krembs & Co., 669 W. Ohio St., Chicago
Merck & Co., Rahway, N. J.
Pfaltz & Bauer, 300 Pearl St., N.Y.
R. J. Prentiss & Co., 100 Gold St., N.Y.
See page 53.
Pylam Products Co., 799 Greenwich St., N.Y.
See page 55.
Sandoz Chem. Works, Inc., 61 Van Dam St.,
N.Y.
Edwin Seebach Co., 912 Broadway, N.Y.
Welch, Holme & Clark Co., Inc.,
563 Greenwich St., N.Y.

CITRAL (see AROMATIC CHEMICALS)**CITRONELLAL (see AROMATIC CHEMICALS)****CITRONELLA OIL (see ESSENTIAL OILS)****CITRONELLOL (see AROMATIC CHEMICALS)**

CLAYS

American Colloid Co., 363 W. Superior St., Chicago
 American Cyanamid & Chem. Corp., 30 Rockefeller Plaza, N.Y.
 Chas. B. Chrystal Co., 11 Park Pl., N.Y.
 A. C. Drury & Co., 219 E. N. Water St., Chicago
 Fezandie & Sperrle, 205 Fulton St., N.Y.
 Goris & Arnstein, 37th & Racine Ave., Chgo.
 Hammill & Gillespie, 225 Broadway, N.Y.
 J. M. Huber, Inc., 460 W. 34th St., N.Y.
 Illinois Silica Co., Cairo, Ill.
 Industrial Chem. Sales Co., 230 Park Ave., N.Y.
Innis, Speiden & Co., 117 Liberty St., N.Y.
 See page 40.

International Silica Co., Cairo, Ill.
 Natural Products Co., 307 W. 8th St., Los Angeles
 National Sales Corp., 33 E. 13th St., Cinn.
 Owyhee Chemical Products Co., 300 W. Adams St., Chicago
 Paper Makers Chemical Corp., Kalamazoo, Mich.
 Peerless Clay & Mineral Co., Pueblo, Colo.
 L. A. Salomon & Bro., 216 Pearl St., N.Y.
 Tamms Silica Co., 228 N. La Salle St., Chicago
 Whittaker, Clark & Daniels, 246 Front St., N.Y.
 Wishnick-Tumpeer, Inc., 295 Madison Ave., N.Y.
 Wyodak Chem. Co., 4600 E. 71st St., Cleveland

CLEANERS, LIQUID

Baird & McGuire, Inc., Holbrook, Mass.
 See pages 14, 15.
 Baums Castorine Co., 200 Mathew St., Rome, N.Y.
Clifton Chem. Co., 247 Front St., N.Y.
 See page 19.
 Creco Co., Inc., Creco Bldg., Long Island City, N.Y.
 Davies-Young Soap Co., Dayton, O.
 See page 23.
Eagle Soap Corp., Huntington, Ind.
 See page 26.
Fuld Bros., 2308 Frederick Ave., Baltimore
 See page 30.
James Good, Inc., Kensington, Phila.
 See page 34.
 R. M. Hollingshead, 840 Cooper St., Camden, N. J.
 Marshall Prods., Inc., 806 N. 1st St., St. Louis
 Palmer Products, Inc., Waukesha, Wis.
 Solshine Mfg. Co., 17 Caldwell St., Boston

CLEANING COMPOUNDS, DRY (see also WASHING COMPOUNDS)

Antiseptol Co., 5524 Northwest Highway, Chicago
 Cary Mfg. Co., Joliet, Ill.
 Chicago Sanitary Prods. Co., 2526 W. Congress St., Chicago
Clifton Chem. Co., 247 Front St., N.Y.
 See page 19.
 Columbia Soap & Chem. Co., Inc., 217-221 Clara St., San Francisco
 Crystal Labs., Inc., 21 W. Park Way, N. E., Pittsburgh
Eagle Soap Corp., Huntington, Ind.
 See page 26.

Fuld Bros., 2308 Frederick Ave., Baltimore
 See page 30.
 Globe Sanitary Supply Co., 2249 E. 38th St., Los Angeles
James Good, Inc., Kensington, Phila.
 See page 34.

Goulard & Olena, Inc., 140 Liberty St., N.Y.
 Hockwald Chem. Co., 30 Bluxome St., San Francisco
 R. M. Hollingshead, 840 Cooper St., Camden, N. J.
 Hubman Supply Co., 225 N. 4th St., Columbus, O.
 Hull Co., 305 Washington St., Brooklyn
 Hunt Mfg. Co., Lisbon Rd., Cleveland
 H. Kohnstamm & Co., 91 Park Pl., N.Y.
 Los Angeles Soap Co., Los Angeles, Calif.
 Mechling Bros. Chemical Co., Camden, N. J.
 Nat'l Milling & Chem. Co., Manayunk, Phila.
 National Soap Co., 357 South 25th St., Tacoma, Wash.
 North Coast Soap & Chem. Wks., Seattle, Wash.
 Pacific Chem. Co., 1421 N. Main St., Los Angeles
 Palmer Products, Inc., Waukesha, Wis.
 Paper Makers Chemical Corp., Kalamazoo, Mich.
 Peck's Prod. Co., 522-40 N. 2nd St., St. Louis
 Philadelphia Quartz Co., 123 S. 3rd St., Phila.
 Procter & Gamble Co., Cincinnati
 Theo. B. Robertson Prods. Co., 700 W. Division St., Chicago
 Solshine Mfg. Co., 17 Caldwell St., Boston
 Solvay Sales Corp., 40 Rector St., N.Y.
 See pages 62, 63.

John T. Stanley Co., 640 W. 30th St., N.Y.
 Stevens Soap Corp., 200 Sullivan St., Bklyn.
 John Sunshine Chem. Co., 604 W. Lake St., Chicago
 United Cleanser Mfg. Co., Cambridge, Mass.
 Warren Soap Mfg. Co., 51 Waverly St., Cambridge, Mass.

CLEANING FLUIDS (Spotting Fluids)

Clifton Chem. Co., 247 Front St., N.Y.
 See page 19.
 B. R. Elk & Co., Garfield, N. J.
Fuld Bros., 2308 Frederick Ave., Baltimore
 See page 30.
James Good, Inc., Kensington, Phila.
 See page 34.
 McKesson & Robbins, Bridgeport, Conn.
 Merck & Co., Rahway, N. J.
 Nevverring Mfg. Co., 200 W. 34th St., N.Y.

CLIPS (for Collapsible Tubes) (see also TUBES, COLLAPSIBLE)

Acme Clip & Mfg. Co., 426 S. Clinton St., Chicago
George G. Rodgers Co., 183 Varick St., N.Y.
 See page 65.

CLOSURES (see CAPS, CORKS, etc.)**CLOVE OIL (see ESSENTIAL OILS)****COAL TAR DISINFECTANTS (see DISINFECTANTS)**

COCOA BUTTER

Walter Baker & Co., 159 Franklin St., N.Y.
 Durkee Famous Foods, Inc., 2670 Elston Ave.,
 Chicago
 Spencer Kellogg & Sons, Buffalo, N.Y.
 A. N. Stollwerck Co., Camden, N. J.

COCONUT OIL

(see also *Brokers and Dealers*)

Atkins, Kroll & Co., 250 California St.,
 San Francisco
 Balfour, Guthrie & Co., 67 Wall St., N.Y.
 Best Foods, Inc., 88 Lexington Ave., N.Y.
 Capital City Products Co., Columbus, O.
 Durkee Famous Foods, Inc., 2670 Elston Ave.,
 Chicago
 Eastern Industries, Inc., 125 Bergen St.,
 Harrison, N. J.
 El Dorado Oil Wks., 230 California St.,
 San Francisco
 Franklin Baker Co., 1500 Bloomfield St.,
 Hoboken, N. J.
 Spencer Kellogg & Sons, Buffalo, N.Y.
 Los Angeles Soap Co., Los Angeles, Calif.
 Philippine Mfg. Co., 244 Calle David,
 Manila, P. I.
 Procter & Gamble Co., Cincinnati, O.
 J. H. Redding Co., 17 Battery Pl., N.Y.
Smith-Weihman Co., 15 Moore St., N.Y.
 See page 61.
 Snow & Cleaver, Inc., 15 William St., N.Y.
 See page facing 3rd cover.
Wilbur-Ellis Co., 17 Battery Pl., N.Y.
 See page 71.

COCONUT OIL SOAPS (Hard Water Bar)

Armour Soap Wks., 1355 W. 31st St., Chicago
 See page 12.
 Baums Castorine Co., 200 Mathews St.,
 Rome, N.Y.
 James Counts Soap Co.,
 2nd & Washington Aves., St. Louis
 Harley Soap Co., 2832 E. Pacific St.,
 Phila., Pa.
 Hewitt Soap Co., Dayton, Ohio
 Hochwald Chem. Co., 30 Bluxome St., San
 Francisco
 Hubman Supply Co., 225 N. 4th St.,
 Columbus, O.
 Jansen Soap & Chemical Co., 324 Leavenworth
 St., San Francisco, Cal.
 H. Kohnstamm & Co., 91 Park Pl., N.Y.
 Los Angeles Soap Co., Los Angeles, Calif.
 National Soap Co., 357 South 25th St.,
 Tacoma, Wash.
 Newell Guttradt Co., 350 Fremont St.,
 San Francisco, Cal.
 North Coast Soap & Chem. Works,
 Seattle, Wash.
 Pacific Chem. Co., 1421 N. Main St.,
 Los Angeles
 Peck's Prod. Co., 522-40 N. 2nd St., St. Louis
 Procter & Gamble Co., Cincinnati
Theo. B. Robertson Prods. Co.,
700 W. Division St., Chicago
 Geo. A. Schmidt Co., 236 W. North Ave.,
 Chicago

Swift & Co., Union Stock Yards, Chicago
 Vliet Soap Co., 638 Monroe St., Brooklyn
 Warren Soap Mfg. Co., 51 Waverly St.,
 Cambridge, Mass.
 M. Werk Co., St. Bernard, Cincinnati
 Allen B. Wisley Co., 6801 W. 65th St.,
 Chicago, Ill.
 Chas. W. Young & Co., Phila.

COLLAPSIBLE TUBES (see TUBES, COLLAPSIBLE)**COLLOID MILLS (see MILLS, COLLOID)****COLORS (see SOAP COLORS, DEODORIZING BLOCK COLORS, ETC.)****COMPOUND CRESOL SOLUTIONS (see CRESOL COMPOUND; DISINFECTANTS, COAL-TAR)****COMPRESSORS (Air)**

Beach-Russ Co., 50 Church St., N.Y.
 Binks Mfg. Co., 3114 Carroll Ave., Chicago
Consolidated Prods. Co., 15 Park Row, N.Y.
 (Used) See page 21.
 Crowell Mfg. Co., 177 Clifton Pl., Bklyn.
 De Vilbiss Co., Toledo, O.
 Electric Sprayit Co., 226 N. Broadway,
 Milwaukee, Wis.
 Fairbanks-Morse & Co.,
 900 S. Wabash Ave., N.Y.
 Foster Pump Works, 50 Washington St., Bklyn.
 Ingersoll-Rand Co., 11 Broadway, N.Y.
 Nash Engineering Co., South Norwalk, Conn.
Newman Tallow & Soap Machy. Co.,
1051 W. 35th St., Chicago (Used)
 See page 45.
Stein-Brill Corp., 183 Varick St., N.Y.
 (Used) See page 65.
 Worthington Pump & Machinery Corp.,
 115 Broadway, N.Y.

CONSULTANTS

Applied Research Laboratories, Dayton, N. J.
 Columbus Labs., 33 N. State St., Chicago
 Curtis & Tompkins, Ltd., 236 Front St.,
 San Francisco, Cal.
 Entomological Testing Labs.,
 114 E. 32nd St., N.Y.
 Wm. Garrigue & Co., 9 S. Clinton St., Chicago
 Lloyd A. Hall, 1415 W. 37th St., Chicago
Hochstadter Laboratories, Inc., 254 W. 31st St.,
N.Y. See page 140.
 Illinois Chemical Labs., 75 E. Wacker Drive.,
 Chicago
 La Wall & Harrison, 214 S. 12th St., Phila.
Alan Porter Lee, Inc., 136 Liberty St., N.Y.
 See page 41.
Pease Laboratories, 39 W. 38th St., N.Y.
 See page 140.
 W. S. Purdy Co., 128 Water St., N.Y.
 Samuel P. Sadtler & Son, 210 S. 13th St., Phila.
 Seil, Putt & Rusby, 16 E. 34th St., N.Y.

CONSULTANTS (Cont'd)

- Skinner & Sherman, 246 Stuart St., Boston
See page 140.
Foster D. Snell, 305 Washington St., Brooklyn
See page 140.
Stillwell & Gladding, 130 Cedar St., N.Y.
Taub Labs., 115 W. 68th St., N.Y.
Wurster & Sanger, 5201 Kenwood Ave., Chgo.

CONTAINERS, SHIPPING (see BOXES)**CONVEYORS**

- Alsop Engineering Corp., 39 W. 60th St., N.Y.
See pages 6, 7.
Bailey-Buruss Co., Atlanta, Ga.
H. W. Caldwell & Son Co., 2410 W. 18th St., Chicago
Consolidated Prods. Co., 15 Park Row, N.Y.
(Used) See page 21.
J. H. Day Co., 1144 Harrison Ave., Cincinnati
Dow Co., 1025 Franklin St., Louisville, Ky.
Wm. Garrigue & Co., 9 S. Clinton St., Chicago
B. F. Gump Co., 431 S. Clinton St., Chicago
Houchin Machinery Co., Hawthorne, N. J.
See page 37.
Jeffrey Mfg. Co., 924 N. 4th St., Columbus, O.
Karl Kiefer Machine Co., Cincinnati
Lancaster Iron Works, Lancaster, Pa.
Link-Belt Co., 910 S. Michigan, Chicago
Newman Tallow & Soap Machy. Co., 1051
W. 35th St., Chicago (Used) See page 45.
Pneumatic Scale Corp., Norfolk Downs, Mass.
See pages 48, 49.
George G. Rodgers Co., 183 Varick St., N.Y.
See page 65.
Standard Conveyor Co., N. St. Paul, Minn.
Stephens-Adamson Mfg. Co., Aurora, Ill.
Sterns Conveyor Co., Cleveland
F. J. Stokes Machine Co., Tabor Rd., Phila., Pa.

COPPER SULFATE (Blue Vitriol)

- American Cyanamid & Chem. Corp.,
30 Rockefeller Plaza, N.Y.
Dow Chemical Co., Midland, Mich., See page 25.
E. I. Du Pont de Nemours & Co.,
Wilmington, Del.
Faesy & Besthoff, Inc., 22 E. 40th St., N.Y.
General Chem. Co., 40 Rector St., N.Y.
See page 31.
Grasselli Chemical Co., 1300 Guardian Bldg.,
Cleveland See page 35.
Harshaw Chemical Co., 1945 E. 97th St.,
Cleveland
Innis, Speiden & Co., 117 Liberty St., N.Y.
See page 40.
Mechling Bros. Chemical Co., Camden, N. J.
Nichols Copper Co., 25 Broad St., N.Y.
Raritan Copper Wks., Perth Amboy, N. J.
E. M. Sergeant Co., 350—5th Ave., N.Y.
Tennessee Copper Co., 61 Broadway, N.Y.

CORKING MACHINERY

- Consolidated Prods. Co., 15 Park Row, N.Y.
(Used) See page 21.
Karl Kiefer Machine Co., Cincinnati
Pneumatic Scale Corp., Norfolk Downs, Mass.
See pages 48, 49.
Stein-Brill Corp., 183 Varick St., N.Y.
(New & Used) See page 65.

CORKS

- Armstrong Cork & Insulation Co.,
Lancaster, Pa.
Cork Import Corp., 345 W. 40th St., N.Y.
Dodge Cork Co., Lancaster, Pa.

CORN OIL*(see also Brokers and Dealers)*

- American Maize Prods. Co.,
41 E. 42nd St., N.Y.
Balfour, Guthrie & Co., Ltd., 67 Wall St., N.Y.
Corn Products Refining Co.,
17 Battery Pl., N.Y.
Durkee Famous Foods, Inc., 2670 Elston Ave.,
Chicago
Early & Daniel Co., Ingalls Bldg., Cincinnati
Otto A. C. Hagen Co., 929 Ledger Bldg.,
Phila.
Spencer Kellogg & Sons, Buffalo, N.Y.
J. H. Redding Co., 17 Battery Pl., N.Y.
Snow & Cleaver, Inc., 15 William St., N.Y.
See page facing 3rd cover.
Staley Sales Corp., Decatur, Ill.
Wilbur-Ellis Co., 17 Battery Pl., N.Y.
See page 71.
Woolner & Co., Peoria, Ill.

COSMETICS (Compacts, Lipsticks, etc.)

- Amer. Perfumers Labs., 151 W. 19th St., N.Y.
Luxor, Ltd., 1355 W. 31st St., Chicago
Oxzyon Co., 154—11th Ave., N.Y.
Geo. A. Schmidt Co., 236 W. North Ave.,
Chicago
Julius Schmid, Inc., 423 W. 55th St., N.Y.
Shorès Co., Cedar Rapids, Ia.
Allen B. Wrisley Co., 6801 W. 65th St., Chicago

COTTONSEED FATTY ACIDS (and Soapstock)*(see also Brokers and Dealers)*

- Armour Soap Wks., 1355 W. 31st St., Chicago
See page 12.
Durkee Famous Foods, Inc., 2670 Elston Ave.,
Chicago
Otto A. C. Hagen Co., 929 Ledger Bldg.,
Phila.
Spencer Kellogg & Sons, Buffalo, N.Y.
Portsmouth Cotton Oil Refining Co.,
Portsmouth, Va.
Procter & Gamble Co., Cincinnati, O.
Snow & Cleaver, Inc., 15 William St., N.Y.
See page facing 3rd cover.
Southern Cotton Oil Co.,
Produce Exchange, N.Y.
Wecoline Products Co., 15 E. 26th St., N.Y.
Wilson-Martin Co., Swanson St., Phila.
Woburn Degreasing Co., 1200 Harrison Ave.,
Harrison, N. J.

COTTONSEED OIL*(see also Brokers and Dealers)*

- Durkee Famous Foods, Inc., 2670 Elston Ave.,
Chicago
Otto A. C. Hagen Co., 929 Ledger Bldg.,
Spencer Kellogg & Sons, Buffalo, N.Y.

COTTONSEED OIL (Cont'd)

Los Angeles Soap Co., Los Angeles, Calif.
 Portsmouth Cotton Oil Refining Corp.,
 Portsmouth, Va.
 Procter & Gamble Co., Cincinnati, O.
 J. H. Redding Co., 17 Battery Pl., N.Y.
 C. F. Simonin's Sons, Phila.
 Snow & Cleaver, Inc., 15 William St., N.Y.
 See page facing 3rd cover.
 Southern Cotton Oil Co.,
 Produce Exchange, N.Y.
 Wilbur-Ellis Co., 17 Battery Pl., N.Y.
 See page 71.

COUMARIN(see also *Aromatic Chemicals*)

Dow Chemical Co., Midland, Mich.
 See page 25.
 Maywood Chem. Wks., Maywood, N. J.
 Monsanto Chemical Works, 1724 S. 2nd St.,
 St. Louis

CREOSOTE OIL

Baird & McGuire, Inc., Holbrook, Mass.
 See page 14, 15.
 Barrett Company, 40 Rector St., N.Y.
 See page 16.
 Samuel Cabot, Inc., 141 Milk St., Boston
 Wm. Cooper & Nephews, 1909 Clinton Ave.,
 Chicago
 Dominion Tar & Chemical Co., Ltd.,
 430 Canada Cement Bldg., Montreal, Canada
 William E. Jordan & Bro., 2590 Atlantic Ave.,
 Brooklyn
 Kentucky Color & Chem. Co., Louisville, Ky.
 Koppers Prods. Co., Koppers Bldg.
 Pittsburgh, Pa.
 Neville Co., Pittsburgh
 Reilly Tar & Chem. Co., Indianapolis
 See page 56.
 White Tar Co., Kearny, N. J.

CRESOL COMPOUND, U.S.P. and Technical

Baird & McGuire, Inc., Holbrook, Mass.
 See page 14, 15.
 Barrett Co., 40 Rector St., N.Y. See page 16.
 Chemical Compounding Corp., 262 Huron St.,
 Brooklyn
 Chemical Supply Co., 2450 Canal Road,
 Cleveland
 Clifton Chem. Co., 247 Front St., N.Y.
 See page 19.
 Creco Co., Inc., Creco Bldg.,
 Long Island City, N.Y.
 Davies-Young Soap Co., Dayton, O.
 See page 23.
 Eagle Soap Corp., Huntington, Ind.,
 See page 26.
 Fuld Bros., 2308 Frederick Ave., Baltimore
 See page 30.
 Globe Sanitary Supply Co., 2249 E. 38th St.,
 Los Angeles
 James Good, Inc., Kensington, Phila.
 See page 34.
 Haag Laboratories, Inc., 6101 S. May St.,
 Chicago
 Harley Soap Co., 2832 E. Pacific St., Phila.
 Hockwald Chem. Co., 30 Bluxome St.,
 San Francisco
 Hunt Mfg. Co., Lisbon Rd., Cleveland
 Industrial Labs., 17-19 W. Conway St.,
 Baltimore

Wm. E. Jordan & Bro., 2590 Atlantic Ave.,
 Brooklyn, N.Y.
 Kemiko Mfg. Co., 191 Murray St.,
 Newark, N. J.
 Koppers Prods. Co., Koppers Bldg.
 Pittsburgh, Pa.
 Mallinckrodt Chemical Works, St. Louis
 McLaughlin Gormley King Co.,
 Minneapolis, Minn.
 Merck & Co., Rahway, N. J.
 New York Soap Corp., 294 Pearl St., N.Y.
 See page 44.
 North Coast Chem. & Soap Wks.,
 Seattle, Wash.
 Pacific Chemical Co., 1421 Main St.,
 Los Angeles
 Palmer Prods., Inc., Waukesha, Wis.
 Peck's Prods. Co., 522-40 N. 2nd St., St. Louis
 Reilly Tar & Chem. Corp., P. O. Box 125,
 Indianapolis See page 56.
 Theo. B. Robertson Prods. Co.,
 700 W. Division St., Chicago
 Shores Co., Cedar Rapids, Ia.
 U. S. Sanitary Specialties Corp.,
 435 S. Western Ave., Chicago
 White Tar Co., Kearny, N. J.

CRESOLS

American-British Chem. Supplies,
 180 Madison Ave., N.Y. See page 9.
 American Cyanamid & Chem. Corp.,
 30 Rockefeller Plaza, N.Y.
 Baird & McGuire, Holbrook, Mass.
 See pages 14, 15.
 Barrett Company, 40 Rector St., N.Y.
 See page 16.
 Innis, Speiden & Co., 117 Liberty St., N.Y.
 See page 40.
 William E. Jordan & Bro., 2590 Atlantic Ave.,
 Brooklyn
 Koppers Prods. Co., Koppers Bldg.
 Pittsburgh, Pa.
 Monsanto Chemical Works, 1724 S. 2nd St.,
 St. Louis
 Reilly Tar & Chem. Corp., P. O. Box 125,
 Indianapolis See page 56.
 White Tar Co., Kearny, N. J.

CRESYLIC ACID

American-British Chem. Supplies,
 180 Madison Ave., N.Y. See page 9.
 American Cyanamid & Chem. Corp.,
 30 Rockefeller Plaza, N.Y.
 Baird & McGuire, Holbrook, Mass.
 See pages 14, 15.
 Barrett Co., 40 Rector St., N.Y. See page 16.
 Wm. Cooper & Nephews, 1909 Clifton Ave.,
 Chicago
 Innis, Speiden & Co., 117 Liberty St., N.Y.
 See page 40.
 William E. Jordan & Bro., 2590 Atlantic Ave.,
 Brooklyn
 Koppers Prods. Co., Koppers Bldg.
 Pittsburgh, Pa.
 Monsanto Chemical Works, 1724 S. 2nd St.,
 St. Louis
 Reilly Tar & Chem. Co., Indianapolis
 See page 56.
 White Tar Co., Kearny, N. J.

CRUTCHERS

- Consolidated Prods. Co., 15 Park Row, N.Y.
(Used) See page 21.
Houchin Machinery Co., Hawthorne, N. J.
See page 37.
Huber Machine Co., 259—46th St., Brooklyn
See page 38.
Littleford Bros., 443 E. Pearl St., Cincinnati
Newman Tallow & Soap Machinery Co.,
1051 W. 35th St., Chicago See page 45.
Patterson Foundry & Machine Co.,
East Liverpool, Ohio
Sowers Mfg. Co., 1296 Niagara St.,
Buffalo, N.Y.
Stein-Brill Corp., 183 Varick St., N.Y.
(Used) See page 65.
Struthers-Wells Co., Warren, Pa.

CUBÉ ROOT (see DERRIS ROOT)**CUSPIDORS, Paper Mache**

- Almo Trading Co., 61 E. 11th St., N. Y.

CUTTING TABLES

- Consolidated Prods. Co., 15 Park Row, N.Y.
(Used) See page 21.
Houchin Machinery Co., Hawthorne, N. J.
See page 37.
Huber Machine Co., 259—46th St., Brooklyn
See page 38.
J. M. Lehmann Co., 248 W. B'way, N.Y.
Newman Tallow & Soap Machinery Co.,
1051 W. 35th St., Chicago See page 45.
Stein-Brill Corp., 183 Varick St., N. Y.
(Used) See page 65.

CYANIDES (see FUMIGANTS)**CYMENE**

- Brown Co., Portland, Me.
Industrial Chem. Sales Co., 230 Park Ave., N.Y.

DEAD OIL, see CREOSOTE OIL**DEALERS (Chemicals)**

- American Cyanamid & Chem. Corp.,
30 Rockefeller Plaza, N.Y.
American Oil & Supply Co., 236 Wilson Ave.,
Newark, N. J.
Baker & Gaffney, Drexel Bldg., Philadelphia
H. J. Baker & Bro., 271 Madison Ave., N.Y.
Barada & Page, Kansas City, Mo.
S. H. Bell Co., 1407 Gulf Bldg., Pittsburgh
Benner Chemical Co., 298 S. La Salle St.,
Chicago
Braun-Knecht-Heimann Co., 584 Mission St.,
San Francisco
Buckeye Soda Products Co., 32 Main St.,
Cincinnati
Calo & Lydon, 90 West St., N.Y.
John A. Chew, 60 E. 42nd St., N.Y.
Consumers Chemical Co., Drexel Bldg.,
Philadelphia
T. G. Cooper & Co., 47 N. 2nd St., Phila.
Dickerson Co., Drexel Bldg., Phila.
Doe & Ingalls, 198 Milk St., Boston
A. C. Drury & Co., 219 East North Water St.,
Chicago

- Eaton Clark Co., 204 Woodward Ave., Detroit
Faesy & Besthoff, 22 E. 40th St., N.Y.
Alex C. Fergusson Co., Drexel Bldg., Phila.
Fort Pitt Chemical Co., 3134 Penn Ave.,
Pittsburgh
Frey & Horgan, 17 State St., N.Y.
Otto A. C. Hagen Co., Public Ledger Bldg.,
Phila.
Harshaw Chemical Co., 1945 E. 97th St.,
Cleveland
Globe Chemical Co., Murray Road, Cinn.
Arnold Hoffman & Co., 55 Canal St.,
Providence, R. I.
Hummel Chemical Co., 90 West St., N.Y.
Innis, Speiden & Co., 117 Liberty St., N.Y.
See page 40.
Jungmann & Co., 157 Chambers St., N.Y.
See inside back cover.
E. & F. King & Co., 405 Atlantic Ave., Boston
Los Angeles Chem. Co., 2200 Santa Fe Ave.,
Los Angeles
George Mann & Co., Providence, R. I.
Merchants Chemical Co.,
21 East 40th St., N.Y.
1314 South Canal St., Chicago
420 Barclay St., Milwaukee
110—6th St., N. E. Minneapolis
Millard-Heath Co., 214 Pine St., St. Louis
Clarence Morgan & Co., 355 W. Ontario St.,
Chicago
National Oil & Supply Co.,
170 Frelinghuysen Ave., Newark, N. J.
National Sales Co., 31 E. 13th St., Cinn.
Newman Tallow & Soap Machinery Co.,
1051 W. 35th St., Chicago See page 45.
Paper Makers Chemical Corp.,
Kalamazoo, Mich.
R. Peltz Co., 112 S. 16th St., Philadelphia
Pfaltz & Bauer, Inc., 300 Pearl St., N.Y.
H. B. Prior Co., 420 Lexington Ave., N.Y.
R. F. Revson Co., 91—7th Ave., N.Y.
G. S. Robins & Co., 310 S. Commercial St.,
St. Louis
Rodgers Chemical Co., Fitzsimmons Bldg.,
Pittsburgh
Rohm & Haas Co., Inc., 222 W. Washington
Sq., Phila. See pages 58, 59.
H. J. Rolls Chemical Co., Buffalo, N.Y.
E. M. Sergeant Pulp & Chemical Co.,
350—5th Ave., N.Y.
J. U. Starkweather Co., Providence, R. I.
Thompson-Hayward Chem. Co.,
2915 Southwestern Blvd., Kansas City
Arthur C. Trask Co., 4103 S. La Salle St.,
Chicago, Ill.
Jos Turner & Co., 500—5th Ave., N.Y.
See page 67.
Welch, Holme & Clark Co., Inc.,
563 Greenwich St., N.Y.

DEALERS (Oils and Fats)

- Balfour, Guthrie & Co., 67 Wall St., N.Y.
Calo & Lydon, 90 West St., N.Y.
Alex Fergusson Co., Drexel Bldg., Phila.
Frey & Horgan, 17 State St., N.Y.
Otto A. C. Hagen Co., Public Ledger Bldg.,
Phila.
A. W. Harris Oil Co., Providence, R. I.
J. H. Hinz Co., 825 Engineers Bldg., Cleveland
Innes & Co., 132 Front St., N.Y.
Miller & Co., 2401 Chestnut St., Philadelphia
Clarence Morgan & Co., 353 W. Ontario St.,
Chicago
Murray Oil Products Co., 21 West St., N.Y.

DEALERS (Oils and Fats) (Cont'd)

Newman Tallow & Soap Machinery Co.,
1051 W. 35th St., Chicago See page 45.
Rayner & Stonington, 79 Wall St., N.Y.
E. M. Sergeant Pulp & Chemical Co.,
Empire State Bldg., N.Y.
E. R. Smead Co., Hanna Bldg., Cleveland
Smith-Weihman Co., 15 Moore St., N.Y.
See page 61.
Swan & Finch Oil Co., 205 E. 42nd St., N.Y.
Arthur C. Trask Co., 4103 S. La Salle St.,
Chicago
Tunley & Co., 31 Water St., N.Y.
Welch, Holme & Clark Co., Inc.,
563 Greenwich St., N.Y.

DECOLORIZING CARBONS

American Active Carbon Co., Columbus, O.
Cliffs-Dow Chem. Co., Marquette, Mich.
Darco Sales Corp., 60 E. 42nd St., N.Y.
Durkee Famous Foods, Inc., 2670 Elston Ave.,
Chicago
Industrial Chem. Sales Co., Inc.,
230 Park Ave., N.Y.
L. A. Salomon & Bro., 216 Pearl St., N.Y.

DEGRAS

American Cyanamid & Chem. Corp.,
30 Rockefeller Plaza, N.Y.
Bopf-Whittam Corp., Westfield, N. J.
Otto A. C. Hagen Co., 929 Ledger Bldg.,
Phila.
Hummel Chemical Co., 90 West St., N.Y.
National Oil Products Co., Harrison, N.J.
Pfaltz & Bauer, Inc., 300 Pearl St., N.Y.
Robinson-Wagner Co., 21 West St., N.Y.

DEODORIZING BLOCK COLORS(see also *Perfuming Compounds*)

American Aniline Products, Inc.,
50 Union Sq., N.Y.
Dyestuffs & Chemicals, Inc.,
11th & Monroe Sts., St. Louis
Fezandie & Sperrle, 205 Fulton St., N.Y.
Interstate Color Co., Inc., 5 Beekman St., N.Y.
Leeben Chemical Co., 389 Washington St., N.Y.
Pylam Products Co., 799 Greenwich St., N.Y.
See page 55.
Sandoz Chem. Wks., 61 Van Dam St., N.Y.

DEODORIZING BLOCK DIES (see SOAP DIES)**DEODORIZING BLOCK HOLDERS (see HOLDERS, DEODORIZING BLOCKS)****DEODORIZING BLOCK PERFUMES (see PERFUMING COMPOUNDS)****DEODORIZING BLOCK PRESSES (see PRESSES)****DEODORIZING BLOCKS**

Antiseptol Co., 5524 Northwest Highway,
Chicago

Chicago Sanitary Prods. Co.,
2526 W. Congress St., Chicago
Churchill Mfg. Co., 309 Douglas St.,
Sioux City, Ia.
Clifton Chem. Co., 247 Front St., N.Y.
See page 19.

Columbia Soap & Chem. Co., Inc.,
324 Leavenworth St., San Francisco
Creco Co., Inc., Creco Bldg.,
Long Island City, N.Y.
Crystal Labs., Inc., 21 W. Park Way, N. E.,
Pittsburgh, Pa.
Davies-Young Soap Co., Dayton, O.
See page 23.

Eagle Soap Corp., Huntington, Ind.,
See page 26.

Fuld Bros., 2308 Frederick Ave., Baltimore
See page 30.

Globe Sanitary Supply Co., 2249 E. 38th St.,
Los Angeles
Goulard & Olena, 140 Liberty St., N.Y.
Hockwald Chemical Co., 30 Bluxome St.,
San Francisco
Hubman Supply Co., 225 N. 4th St.,
Columbus, O.
Industrial Labs., 17-19 W. Conway St.,
Baltimore

Jansen Soap & Chemical Co., 324 Leavenworth
St., San Francisco, Cal.

Kemiko Mfg. Co., 191 Murray St.,
Newark, N. J.

Koppers Prods. Co., Koppers Bldg.,
Pittsburgh, Pa.

Marshall Products, Inc., 806 N. 1st St.,
St. Louis

Maywood Pest Exterminators, 1206 S. 1st Ave.,
Maywood, Ill.

New York Soap Corp., 294 Pearl St., N.Y.
See page 44.

North Coast Soap & Chem. Wks.,
Seattle, Wash.

Palmer Products Inc., Waukesha, Wis.

Peck's Prods. Co., 522-40 N. 2nd St., St. Louis

Puritan Chemical Co., Atlanta, Ga.

Theo. B. Robertson Prods. Co.,
700 W. Division St., Chicago

Selig Co., 336 Marietta St., Atlanta, Ga.

Uncle Sam Chemical Co., 329 E. 29th St., N.Y.

U. S. Sanitary Specialties Corp.,
435 S. Western Ave., Chicago

White Tar Co., Kearny, N. J.

DEODORIZING CRYSTALS

Antiseptol Co., 5524 Northwest Highway,
Chicago

Chicago Sanitary Prods. Co.,
2526 W. Congress St., Chicago

Churchill Mfg. Co., 309 Douglas St.,
Sioux City, Ia.

Clifton Chem. Co., 247 Front St., N.Y.
See page 19.

Creco Co., Inc., Creco Bldg.,
Long Island City, N.Y.

Davies-Young Soap Co., Dayton, O.
See page 23.

Eagle Soap Corp., Huntington, Ind.,
See page 26.

Fuld Bros., 2308 Frederick Ave., Baltimore
See page 30.

Globe Sanitary Supply Co., 2249 E. 38th St.,
Los Angeles

Goulard & Olena, 140 Liberty St., N.Y.

DEODORIZING CRYSTALS (Cont'd)

Hockwald Chem. Co., 30 Bluxome St.,
San Francisco
Hubman Supply Co., 225 N. 4th St.,
Columbus, O.
Jansen Soap & Chem. Co., 324 Leavenworth St.,
San Francisco, Cal.
Kemiko Mfg. Co., 191 Murray St.,
Newark, N. J.
Koppers Prods. Co., Koppers Bldg.,
Pittsburgh, Pa.
Marshall Prods., Inc., 806 N. 1st St., St. Louis
New York Soap Corp., 294 Pearl St., N.Y.
See page 44.
Pacific Chem. Co., 1421 N. Main St.,
Los Angeles
Palmer Prod., Inc., Waukesha, Wis.
Peck's Prods. Co., 522-40 N. 2nd St., St. Louis
Theo. B. Robertson Prods. Co.,
700 W. Division St., Chicago
Sanico Chemical Corp., 611 Broadway, N.Y.
Uncle Sam Chemical Co., 329 E. 29th St., N.Y.
U. S. Sanitary Specialties Corp.,
435 S. Western Ave., Chicago
White Tar Co., Kearny, N. J.

DEODORIZING EQUIPMENT (For Oils)

Edouard Bataille, 350—5th Ave., N.Y.
Albert H. Bruecke, 30 Rockefeller Plaza, N.Y.
See page 18.
Consolidated Prods. Co., 15 Park Row, N.Y.
(Used) See page 21.
Wm. Garrigue & Co., 9 S. Clinton St., Chgo.
Houchin Machinery Co., Hawthorne, N. J.
See page 37.
Alan Porter Lee, Inc., 136 Liberty St., N.Y.
See page 41.
Ernest Scott & Co., Fall River, Mass.
Stein-Brill Corp., 183 Varick St., N.Y.
(Used) See page 65.
F. J. Stokes Machine Co., 5974 E. Tabor Rd.,
Phila.
Wurster & Sanger, 5201 Kenwood Ave., Chgo.

DERRIS EXTRACT

Derris, Inc., 79 Wall St., N.Y. See page 24.
McCormick & Co., Baltimore, Md. See page 72.
Murray & Nickell Mfg. Co.,
2608 Arthington St., Chicago
S. B. Penick & Co., 132 Nassau St., N.Y.
See page 47.
John Powell & Co., 114 E. 32nd St., N.Y.
See pages 51, 52.
R. J. Prentiss & Co., 100 Gold St., N.Y.
See page 53.

DERRIS ROOT

Derris, Inc., 79 Wall St., N.Y. See page 24.
J. L. Hopkins & Co., 220 Broadway, N.Y.
McCormick & Co., Baltimore See page 72.
Murray & Nickell Mfg. Co.,
2608 Arthington St., Chicago
S. B. Penick & Co., 132 Nassau St., N.Y.
See page 47.
John Powell & Co., 114 E. 32nd St., N.Y.
See pages 51, 52.
R. J. Prentiss & Co., 100 Gold St., N.Y.
See page 53.

DIES (see SOAP DIES)**DIETHANOLAMINE (see ETHANOLAMINE)****DIP OIL**

Baird & McGuire, Holbrook, Mass.
See pages 14, 15.
Chemical Supply Co., 2450 Canal Rd., Cleveland
Clifton Chem. Co., 247 Front St., N.Y.
See page 19.
Wm. Cooper & Nephews, 1909 Clifton Ave.,
Chicago
William E. Jordan & Bro., 2590 Atlantic Ave.,
Brooklyn
Koppers Prods. Co., Koppers Bldg.,
Pittsburgh, Pa.
McLaughlin Gormley King Co.,
Minneapolis, Minn.
Reilly Tar & Chem. Corp., P. O. Box 125,
Indianapolis See page 56.
White Tar Co., Kearny, N. J.

DIPHENYL OXIDE (see AROMATIC CHEMICALS)**DISH WASHING COMPOUNDS (see WASHING COMPOUNDS)****DISINFECTANTS, CHLORINATED**

Baird & McGuire, Inc., Holbrook, Mass.
See page 14, 15.
Carbide & Carbon Chemicals Corp.,
30 E. 42nd St., N.Y.
Chemical Compounding Corp., 262 Huron St.,
Brooklyn
Chemical Supply Co., 2450 Canal Rd., Cleveland
Chicago Sanitary Prods. Co.,
2526 W. Congress St., Chicago
Churchill Mfg. Co., 309 Douglas St.,
Sioux City, Ia.
Creco Co., Inc., Creco Bldg.,
Long Island City, N.Y.
Eagle Soap Corp., Huntington, Ind.,
See page 26.
Fuld Bros., 2308 Frederick Ave., Baltimore
See page 30.
Globe Sanitary Supply Co., 2249 E. 38th St.,
Los Angeles
James Good, Inc., Kensington, Phila.
See page 34.
Goulard & Olena, Inc., 140 Liberty St., N.Y.
Hockwald Chem. Co., 30 Bluxome St.,
San Francisco, Cal.
Hubman Supply Co., 225 N. 4th St.,
Columbus, O.
Hunt Mfg. Co., Lisbon Rd., Cleveland
Mathieson Alkali Works, 60 E. 42nd St., N.Y.
McLaughlin Gormley King Co.,
Minneapolis, Minn.
Merck & Co., Rahway, N. J.
Monsanto Chemical Works, 1724 S. 2nd St.,
St. Louis
Niagara Alkali Co., 9 E. 41st St., N.Y.
See page 46.

DISINFECTANTS, CHLORINATED (Cont'd)

North Coast Soap & Chem. Works,
Seattle, Wash.
Theo. B. Robertson Prods. Co.,
700 W. Division St., Chicago
Sherwin-Williams Co., 601 Canal Rd.,
Cleveland
U. S. Sanitary Specialties Corp.,
435 S. Western Ave., Chicago

DISINFECTANTS, COAL TAR

American Cyanamid & Chem. Corp.,
30 Rockefeller Plaza, N.Y.
An-Fo Mfg. Co., 3129 Elmwood Ave.,
Oakland, Cal.
Baird & McGuire, Inc., Holbrook, Mass.
See pages 14, 15.
Samuel Cabot, Inc., 141 Milk St., Boston
Chemical Compounding Corp., 262 Huron St.,
Brooklyn
Chemical Supply Co., 2450 Canal Rd., Cleveland
Chicago Sanitary Prods. Co.,
2526 W. Congress St., Chicago
Clifton Chemical Co., 247 Front St., N.Y.
See page 19.
Wm. Cooper & Nephews, 1909 Clifton Ave.,
Chicago
Creco Co., Inc., Creco Bldg.,
Long Island City, N.Y.
Davies-Young Soap Co., Dayton, O.
See page 23.
Eagle Soap Corp., Huntington, Ind.
See page 26.
Fergusson Laboratories, Drexel Bldg., Phila.
Fuld Bros., 2308 Frederick Ave., Baltimore
See page 30.
Globe Sanitary Supply Co., 2249 E. 38th St.,
Los Angeles
James Good, Inc., Kensington, Phila.
See page 34.
Goulard & Olena, 140 Liberty St., N.Y.
Haag Laboratories, Inc., 6101 S. May St.,
Chicago
Harley Soap Co., 2832 E. Pacific St., Phila.
Hockwald Chem. Co., 30 Bluxome St.,
San Francisco
Hubman Supply Co., 225 N. 4th St.,
Columbus, O.
Hunt Mfg. Co., Lisbon Rd., Cleveland
William E. Jordan & Bro., 2590 Atlantic Ave.,
Brooklyn
Koppers Prods. Co., Koppers Bldg.,
Pittsburgh, Pa.
McLaughlin Gormley King Co.,
1715 Fifth St., S. E., Minneapolis, Minn.
Merck & Co., Rahway, N. J.
New York Soap Corp., 294 Pearl St., N.Y.
See page 44.
Perrow Chem. Co., Hurt, Va.
Theo. B. Robertson Prods. Co.,
700 W. Division St., Chicago
Sherwin-Williams Co., 601 Canal Rd.,
Cleveland, Ohio
Shores Co., Cedar Rapids, Ia.
Vliet & Co., 638 Monroe St., Brooklyn
West Disinfecting Co., Long Island City, N.Y.
White Tar Co., Kearny, N. J.

DISINFECTANTS, PINE OIL

An-Fo Mfg. Co., 3129 Elmwood Ave.,
Oakland, Cal.

Antiseptol Co., 5524 Northwest Highway,
Chicago

Baird & McGuire, Inc., Holbrook, Mass.

See pages 14, 15.

Chemical Compounding Corp.,
262 Huron St., Bklyn.

Chemical Supply Co., 2450 Canal Rd., Cleveland

Chicago Sanitary Prods. Co.,

2526 W. Congress St., Chicago

Churchill Mfg. Co., 309 Douglas St.,
Sioux City, Ia.

Clifton Chemical Co., 247 Front St., N.Y.

See page 19.

Columbia Soap & Chem. Co.,

324 Leavenworth St., San Francisco

Wm. Cooper & Nephews, 1909 Clifton Ave.,

Chicago

Creco Co., Inc., Creco Bldg.,

Long Island City, N.Y.

Davies-Young Soap Co., Dayton, O.

See page 23.

Eagle Soap Corp., Huntington, Ind.

See page 26.

Fergusson Labs., Drexel Bldg., Phila.

Fuld Bros., 2308 Frederick Ave., Baltimore

See page 30.

Globe Sanitary Supply Co., 2249 E. 38th St.,
Los Angeles

James Good, Inc., Kensington, Phila.

See page 34.

Goulard & Olena, Inc., 140 Liberty St., N.Y.

Haag Laboratories, Inc., 6101 S. May St.,
Chicago

Harley Soap Co., 2832 E. Pacific St., Phila.

Hockwald Chem. Co., 30 Bluxome St.,
San Francisco

Hubman Supply Co., 225 N. 4th St.,
Columbus, O.

Hunt Mfg. Co., Lisbon Rd., Cleveland

Jansen Soap & Chem. Co., 324 Leavenworth St.,
San Francisco, Cal.

Koppers Prods. Co., Koppers Bldg.,
Pittsburgh, Pa.

McLaughlin Gormley King Co.,
Minneapolis, Minn.

New York Soap Corp., 294 Pearl St., N.Y.

See page 44.

Pacific Chem. Co., 1421 N. Main St.,
Los Angeles

Palmer Prods., Inc., Waukesha, Wis.

Perrow Chem. Co., Hurt, Va.

Theo. B. Robertson Prods. Co.,

700 W. Division St., Chicago

Sherwin-Williams Co., 601 Canal Rd.,
Cleveland, O.

Shores Co., Cedar Rapids, Ia.

U. S. Sanitary Specialties Corp.,

435 S. Western Ave., Chicago

West Disinfecting Co., Long Island City, N.Y.

White Tar Co., Kearny, N. J.

DISINFECTANTS, COEFFICIENT TESTS
(see CONSULTANTS)**DISSEMINATORS, PERFUMES (see**
PERFUME DISSEMINATORS)**DISPENSERS, Liquid Soap (see SOAP**
DISPENSERS)

DRAIN PIPE SOLVENTS

Antiseptol Co., 5524 Northwest Highway,
Chicago
Chicago Sanitary Prods. Co.,
2526 W. Congress St., Chicago
Churchill Mfg. Co., 309 Douglas St.,
Sioux City, Ia.
Clifton Chemical Co., 247 Front St., N.Y.
See page 19.
Creco Co., Inc., Creco Bldg.,
Long Island City, N.Y.
Eagle Soap Corp., Huntington, Ind.,
See page 26.
Fuld Bros., 2308 Frederick Ave., Baltimore
See page 30.
James Good, Inc., Kensington, Phila.
See page 34.
Goulard & Olena, Inc., 140 Liberty St., N.Y.
Hockwald Chem. Co., 30 Bluxome St.,
San Francisco
Hubman Supply Co., 225 N. 4th St.,
Columbus, O.
Hull Co., 305 Washington St., Brooklyn
Industrial Labs., 17-19 W. Conway St.,
Baltimore
Kemiko Mfg. Co., 191 Murray St.,
Newark, N. J.
Mechling Bros. Chemical Co.,
Line St. & Coopers Creek, Camden, N.J.
North Coast Chem. & Soap Wks.,
Seattle, Wash.
Palmer Products, Inc., Waukesha, Wis.
Theo. B. Robertson Prods. Co.,
700 W. Division St., Chicago
John Sunshine Chem. Co., 604 W. Lake St.,
Chicago
U. S. Sanitary Specialties Corp.,
435 S. Western Ave., Chicago

DRIP MACHINES

Clifton Chemical Co., 247 Front St., N.Y.
See page 19.
Eagle Soap Corp., Huntington, Ind.,
See page 26.
Fuld Bros., 2308 Frederick Ave., Baltimore
See page 30.
Garnet Chem. Corp., 911 N. Lumber St.,
Allentown, Pa.
Hockwald Chem. Co., 30 Bluxome St.,
San Francisco
Palmer Prods. Inc., Waukesha, Wis.
Rochester Germicide Co., 16 Dowling Pl.,
Rochester, N.Y.
Sanitary Supplies Co., P. O. Box 5208, Phila.
Wilson & Bennett Mfg. Co.,
6532 S. Menard Ave., Chicago

**DRUM FILLING MACHINERY (see FILL-
ING MACHINERY, DRUMS)****DRUM WASHERS (see WASHING MA-
CHINERY, DRUMS)****DRUMS (see BARRELS)****DRY CLEANING SOAPS**

Armour Soap Wks., 1355 W. 31st St., Chicago
See page 12.
Beltine Chem. & Mfg. Co.,
6155 Wentworth Ave., Chicago

Cincinnati Soap Co., Cincinnati
Clifton Chemical Co., 247 Front St., N.Y.
See page 19.
Davies Young Soap Co., Dayton, O.
See page 23.
Eagle Soap Corp., Huntington, Ind.
See page 26.
J. Eavenson & Sons, Del. & Penn Sts.,
Camden, N. J.
Foree Prods. Co., Chicago
Fuld Bros., 2303 Frederick Ave., Baltimore
See page 30.
Harley Soap Co., 2832 E. Pacific St., Phila.
H. Kohnstamm & Co., 91 Park Pl., N.Y.
Kranich Soap Co., 54 Richards St., Brooklyn
Midland Chem. Labs., Dubuque, Ia.
North Coast Chem. & Soap Wks.,
Seattle, Wash.
Riverside Mfg. Co., 4919 Conn St., St. Louis
John T. Stanley Co., 640 W. 30th St., N.Y.
Ultra Chem. Wks., Inc., Kitay Bldg.,
Paterson, N. J.
Warren Soap Mfg. Co., 51 Waverly St.,
Cambridge, Mass.

DRYERS, CHIP SOAP and BARS

Consolidated Prods. Co., 15 Park Row, N.Y.
(Used) See page 21.
Houchin Machinery Co., Hawthorne, N. J.
See page 37.
Huber Machine Co., 259-46th St., Brooklyn
See page 38.
Newman Tallow & Soap Machy. Co.,
1051 W. 35th St., Chicago (Used) See page 45.
Proctor & Schwartz, 7th St. & Tabor Rd.,
Philadelphia See page 54.
C. G. Sargent's Sons, Graniteville, Mass.
See page 60.
Stein-Brill Corp., 183 Varick St., N.Y.
(Used) See page 65.

DRYING MACHINERY (General)

C. O. Bartlett & Snow Co., Cleveland
Buck Dryer Corp., Manchester, Conn.
Buckeye Dryer Co., 131 W. Lake St., Chicago
Buffalo Forge Co., 490 Broadway, Buffalo, N.Y.
Buffalo Foundry & Machine Co., Buffalo, N.Y.
Consolidated Prods. Co., 15 Park Row, N.Y.
(Used) See page 21.
Gordon Davis Engineering Co.,
21 E. 40th St., N.Y.
Drying Systems, Inc., 1800 Foster Ave., Chicago
Ellis Dryer Co.,
Roosevelt Road & Talman Ave., Chicago
B. F. Gump Co., 431 S. Clinton St., Chicago
Houchin Machinery Co., Hawthorne, N. J.
See page 37.
Lancaster Iron Works, Lancaster, Pa.
J. M. Lehmann Co., 248 W. Broadway, N.Y.
Louisville Drying Equipment Co.,
Louisville, Ky.
Newman Tallow & Soap Machy. Co.,
1051 W. 35th St., Chicago (Used) See page 45.
Oven Equipment Co., New Haven, Conn.
Philadelphia Drying Mach. Co., Philadelphia
Proctor & Schwartz, 7th St. & Tabor Rd.,
Philadelphia See page 54.
C. G. Sargent's Sons Corp.,
Graniteville, Mass. See page 60.
Ernest Scott & Co., Fall River, Mass.

DRYING MACHINERY (Cont'd)

Stein-Brill Corp., 183 Varick St., N.Y.
(Used) See page 65.
F. J. Stokes Machine Co., Philadelphia, Pa.
Struthers-Wells Co., Warren, Pa.
B. F. Sturtevant Co., Hyde Park, Boston

DUST PANS

A. Kreamer, Inc., 307 Kent Ave., Brooklyn
F. H. Lawson Co., Cincinnati

EMULSIFYING AGENTS

American Colloid Co., 363 W. Superior St., Chicago
Arabol Mfg. Co., 110 E. 42nd St., N.Y.
Carbide & Carbon Chemicals Corp., 30 E. 42nd St., N.Y.
A. C. Drury & Co., 219 North East Water St., Chicago
Hull Co., 305 Washington St., Bklyn.
Industrial Chem. Sales Co., 230 Park Ave., N.Y.
Innis, Speiden & Co., 117 Liberty St., N.Y.
See page 40.
Jungmann & Co., 157 Chambers St., N.Y.
See inside back cover.
National Oil Products Co., Harrison, N. J.
Natural Products Co., 307 W. 8th St., Los Angeles
Procter & Gamble Co., Cincinnati
Pylam Products Co., 799 Greenwich St., N.Y.
See page 55.
Richards Chem. Works, 190 Warren St., Jersey City, N.J.
Sandoz Chemical Works, Inc., 61 Van Dam St., N.Y.
Jacques Wolfe & Co., Passaic, N.J.

ESSENTIAL OILS

van Ameringen-Haebler, Inc., 315—4th Ave., N.Y. See pages 10, 11.
Aromatic Products, Inc., 15 E. 30th St., N.Y. See page 12.
Arthur Bennett, Inc., 109 W. Austin Ave., Chicago
W. J. Bush & Co., 11 E. 38th St., N.Y.
Ph. Chaleyser, Inc., 200 Varick St., N.Y.
Antoine Chiris Co., 147 Waverly Pl., N.Y.
Compagnie Duval, 121 E. 24th St., N.Y.
Compagnie Parento, Inc., Croton-on-Hudson, N.Y.
Cox, Aspden & Fletcher, 39 Cortlandt St., N.Y.
Dodge & Olcott Co., 180 Varick St., N.Y.
P. R. Dreyer Inc., 12 E. 12th St., N.Y.
A. C. Drury & Co., 219 East North Water St., Chicago, Ill.
Felton Chemical Co., 603 Johnson Ave., Brooklyn See page 29.
Chas. Fischbeck Co., 119 W. 19th St., N.Y.
Benj. French, Inc., 160—5th Ave., N.Y.
Fritzsch Brothers, Inc., 76 Ninth Ave., N.Y.
Givaudan-Delawanna, Inc., 80—5th Ave., N.Y. See inside front cover, 33.
James B. Horner, Inc., 3 Platt St., N.Y.
Chas. L. Huisking & Co., 155 Varick St., N.Y.
Hymes Bros. Co., 37 Howard St., N.Y.
Industrial Organics, 151 W. 25th St., N.Y.
Lautier Fils, 158 W. 18th St., N.Y.
Leghorn Trading Co., 155 E. 44th St., N.Y. See page 42.
Pierre Lemoine, Inc., 62 Watts St., N.Y.
Geo. Lueders & Co., 427 Washington St., N.Y.

Magnus, Mabey & Reynard, 32 Cliff St., N.Y.
J. Manheimer, 10 Greene St., N.Y.
A. Maschmeijer, Jr., Inc., 43 W. 16th St., N.Y.
Hijos de Francisco Navarro, 119 Nassau St., N.Y.
Neumann-Buslee & Wolfe, 224 W. Huron St., Chicago
Norda, Inc., 601 W. 26th St., N.Y.
Orbis Products Corp., 215 Pearl St., N.Y. See page 4.
Pfaltz & Bauer, Inc., 300 Pearl St., N.Y.
Polak's Frutal Wks., Inc., 350 W. 31st St., N.Y.
Riviera Products Co., 215 W. Ohio St., Chicago
H. C. Ryland, Inc., 161 Water St., N.Y.
Schimmel & Co., 601 W. 26th St., N.Y.
Edwin Seebach Co., 912 Broadway, N.Y.
Wm. G. Sibbach & Co., 201 S. 2nd Ave., Maywood, Ill.
Geo. Silver Import Co., 353—4th Ave., N.Y.
Standard Aromatics, Inc., Bush Terminal Bldg. #1, Bklyn., N.Y.
Synfleur Scientific Labs., Monticello, N.Y.
A. M. Todd Co., Kalamazoo, Mich.
George Uhe, 11 Cliff St., N.Y. (Broker)
Ungerer & Co., 13 W. 20th St., N.Y. See page facing inside front cover, 68.
Albert Verley, Inc., 11 E. Austin Ave., Chicago See page 69.

ETHANOLAMINE

Carbide & Carbon Chemicals Corp., 30 E. 42nd St., N.Y.

ETHER

American Solvents & Chem. Corp., 285 Madison Ave., N.Y.
Carbide & Carbon Chemicals Corp., 30 E. 42nd St., N.Y.
Chas. Cooper & Co., 194 Worth St., N.Y.
Mallinckrodt Chem. Wks., 3600 N. 2nd St., St. Louis
Merck & Co., Rahway, N. J. (also Petroleum)
Skelly Oil Co., 2534 Madison Ave., Kansas City, Mo. (Petroleum)
U. S. Industrial Chem. Co., 110 E. 42nd St., N.Y.

ETHYLENE DICHLORIDE (see SOLVENTS, ORGANIC)**EUCALYPTUS OIL (see ESSENTIAL OILS)****EVAPORATORS**

E. B. Badger & Sons Co., 75 Pitt St., Boston
Buffalo Fndry. & Mach. Co., Buffalo, N.Y.
Chemical Equipment Co., Montpelier, Ind.
Consolidated Prods. Co., 15 Park Row, N.Y. (Used) See page 21.
William Garrigue & Co., 9 S. Clinton St., Chicago
Kestner Evaporator Co., 18th St. & Allegheny Ave., Philadelphia
Lancaster Iron Works, Lancaster, Pa.
Newman Tallow & Soap Machy. Co., 1051 W. 35th St., Chicago (Used) See page 45.
Ernest Scott & Co., Fall River, Mass.
Stein-Brill Corp., 183 Varick St., N. Y. (Used) See page 65.

EVAPORATORS (Cont'd)

F. J. Stokes Machine Co., Phila., Pa.
 Struthers-Wells Titusville Corp., Warren, Pa.
 Swenson Evaporator Co., Harvey, Ill.
 Wurster & Sanger, 5201 Kenwood Ave., Chicago
 Zarembo Co., 506 Crosby Bldg., Buffalo, N. Y.

FANS (Ventilating & Exhaust)

Buffalo Forge Co., 490 Broadway, Buffalo
 Duriron Co., Dayton, O.
 Garden City Fan Co., McCormick Bldg., Chgo.
 General Regulator Corp., 2608 Arthington St., Chicago
 Graybar Electric Co., 180 Varick St., N. Y.

FAT SPLITTING REAGENTS

Twitchell Process Co., St. Bernard, Ohio

FATTY ACID PLANTS

Albert H. Bruecke, 30 Rockefeller Plaza, N. Y. See page 18.
 William Garrigue & Co., 9 S. Clinton St., Chicago
 Alan Porter Lee, Inc., 136 Liberty St., N. Y. See page 41.
 Ernest Scott & Co., Fall River, Mass.
 Wurster & Sanger, 5201 Kenwood Ave., Chicago

FATTY ACIDS

(see also *Brokers and Dealers*)

Armour Soap Wks., 1355 W. 31st St., Chicago See page 12.
 Celina Stearic Acid Co., Celina, Ohio
 Darling & Co., 4201 So. Ashland Ave., Chicago
 Durkee Famous Foods, Inc., 2670 Elston Ave., Chicago
 Emery Industries, Inc., 4300 Carew Tower, Cincinnati
 A. Gross & Co., 122 E. 42nd St., N.Y.
 Industrial Chem. Sales Co., Inc., 230 Park Ave., N.Y.
 Spencer Kellogg & Sons, Buffalo, N.Y.
 Leghorn Trading Co., 155 E. 44th St., N.Y. See page 42.
 Los Angeles Soap Co., Los Angeles, Calif.
 Procter & Gamble Co., Cincinnati, O.
 J. H. Redding Co., 17 Battery Pl., N.Y.
 Silmo Chemical Co., Vineland, N.J.
 C. F. Simonin's Sons, Tioga & Belgrade Sts., Phila.
 Snow & Cleaver, Inc., 15 William St., N.Y. See page facing 3rd cover.
 Southern Cotton Oil Co., Produce Exchange, N.Y.
 Swift & Co., Union Stock Yards, Chicago
 Theobald Animal By-Products Refinery, Kearny, N.J.
 Twitchell Process Co., Ivorydale, Ohio
 Wecoline Products, Inc., 15 E. 26th St., N.Y.
 M. Werk Co., St. Bernard, Cincinnati
 Wilbur-Ellis Co., 17 Battery Pl., N.Y. See page 71.
 Wilson-Martin Co., Swanson St., Phila.
 Woburn Degreasing Co., 1200 Harrison Ave., Harrison, N.J.

FATTY ALCOHOLS, Sulfonated, see SULFONATED FATTY ALCOHOLS**FATTY ALCOHOLS**

E. I. Du Pont de Nemours & Co., Wilmington, Del.
 Michel Export Co., 95 Broad St., N.Y.

FELDSPAR

E. I. Du Pont de Nemours & Co., Wilmington, Del.
 Foote Mineral Co., 1608 Summer St., Phila.
 Hammill & Gillespie, 225 Broadway, N.Y.
 Harshaw Chemical Co., 1945 E. 97th St., Cleveland
 Innis, Speiden & Co., 117 Liberty St., N.Y. See page 40.
 Tamms Silica Co., 228 N. La Salle St., Chgo.

FIBRE CASES (see BOXES, FIBRE)**FIBRE CANS (see CANS, FIBRE)****FILLERS, see TALC, BENTONITE, CLAYS, ETC.****FILLING MACHINERY (Flakes)**

Consolidated Prods. Co., 15 Park Row, N.Y. (Used) See page 21.
 J. L. Ferguson Co., Joliet, Ill.
 B. F. Gump Co., 431 S. Clinton St., Chicago, (Bbls. & Bags)
 S. Howes Co., Silver Creek, N.Y. (Bbls.)
 Johnson Automatic Sealer Co., Ltd. Battle Creek, Mich.
 Newman Tallow & Soap Machy. Co., 1051 W. 35th St., Chicago (Used) See page 45.
 Pneumatic Scale Corp., Norfolk Downs, Mass. See page 48, 49.
 Stein-Brill Corp., 183 Varick St., N.Y. (New & Used) See page 65.
 Stokes & Smith Co., 4915 Summerdale Ave., Philadelphia See page 66.
 Triangle Package Machinery Co., 906 N. Spaulding Ave., Chicago

FILLING MACHINERY (Liquids, Bottles)

Alsop Engineering Corp., 39 W. 60th St., N.Y. See pages 6, 7.
 Consolidated Prods. Co., 15 Park Row, N.Y. (Used) See page 21.
 Ertel Engineering Corp., 120 E. 16th St., N.Y. See page 27.
 Karl Kiefer Machine Co., Cincinnati
 Newman Tallow & Soap Machy. Co., 1052 W. 35th St., Chicago See page 45.
 Pneumatic Scale Corp., Norfolk Downs, Mass. See pages 48, 49.
 Scientific Filter Co., 1 Franklin Sq., N.Y.
 Stein-Brill Corp., 183 Varick St., N.Y. (New & Used) See page 65.
 U. S. Bottlers Machinery Co., 4025 N. Rockwell St., Chicago
 Vol-U-Meter Co., 707 Ohio St., Buffalo

FILLING MACHINERY (Liquids, Cans)

Alsop Engineering Corp., 39 W. 60th St., N.Y. See pages 6, 7.
 Consolidated Prods. Co., 15 Park Row, N.Y. (Used) See page 21.

FILLING MACHINERY (Liquids, Cans)
(Cont'd)

Horix Mfg. Co., Corliss Station, Pittsburgh
 Karl Kiefer Machine Co., Cincinnati
Newman Tallow & Soap Machy. Co.,
 1051 W. 35th St., Chicago See page 45.
Pneumatic Scale Corp., Norfolk Downs, Mass.
 See pages 48, 49.
 Scientific Filter Co., 1 Franklin Sq., N.Y.
Stein-Brill Corp., 183 Varick St., N.Y.
 (New & Used) See page 65.
 F. J. Stokes Machine Co.,
 Tabor Rd., Philadelphia
 U. S. Bottlers Machinery Co.,
 4025 N. Rockwell St., Chicago
 The Vol-U-Meter Co., 707 Ohio St.,
 Buffalo, N.Y.

FILLING MACHINERY (Liquids, Drums)

Alsop Engineering Corp., 39 W. 60th St., N.Y.
 See pages 6, 7.
Consolidated Prods. Co., 15 Park Row, N.Y.
 (Used) See page 21.
 National Acme Co., E. 131st St. & Coit Ave.,
 Cleveland
Newman Tallow & Soap Machy. Co.,
 1051 W. 35th St., Chicago See page 45.
 Scientific Filter Co., 1 Franklin Sq., N.Y.
Stein-Brill Corp., 183 Varick St., N.Y.
 (New & Used) See page 65.
 The Vol-U-Meter Co., 707 Ohio St.,
 Buffalo, N.Y.

FILLING MACHINERY (Pastes, Cans)

Consolidated Prods. Co., 15 Park Row, N.Y.
 (Used) See page 21.
 Filler Machine Co., 1250 E. Montgomery St.,
 Philadelphia
 Karl Kiefer Machine Co., Cincinnati
Newman Tallow & Soap Machy. Co.,
 1051 W. 35th St., Chicago See page 45.
 Progressive Eng. Co., Torresdale, Pa.
 Scientific Filter Co., 1 Franklin Sq., N.Y.
 C. T. Small Mfg. Co., 1204 Ferguson Ave.,
 St. Louis, Mo.
 Sprague-Sells Corp., 308 W. Washington St.,
 Chicago
Stein-Brill Corp., 183 Varick St., N.Y.
 (New & Used) See page 65.
Stokes & Smith Co., 4915 Summerdale Ave.,
 Phila. See page 66.
 F. J. Stokes Mach. Co., 5974 E. Tabor Rd.,
 Philadelphia
 Triangle Package Machy. Co.,
 910 N. Spaulding Ave., Chicago
 Vol-U-Meter Co., 707 Ohio St., Buffalo, N.Y.

FILLING MACHINERY (Pastes, Drums)

Consolidated Prods. Co., 15 Park Row, N.Y.
 (Used) See page 21.
 J. H. Day Co., 1144 Harrison Ave., Cincinnati
Newman Tallow & Soap Machy. Co.,
 See page 45.
Stein-Brill Corp., 183 Varick St., N.Y.
 (Used) See page 65.
Stokes & Smith Co., 4915 Summerdale Ave.,
 Phila. See page 66.

FILLING MACHINERY (Pastes, Tubes)

Arthur Colton Co., Detroit, Mich.

Consolidated Prods. Co., 15 Park Row, N.Y.
 (Used) See page 21.
 Karl Kiefer Machine Co., Cincinnati
Stein-Brill Corp., 183 Varick St., N.Y.
 (New & Used) See page 65.
 F. J. Stokes Mach. Co., 5974 E. Tabor Rd.,
 Philadelphia

FILLING MACHINERY (Powders)

Consolidated Package Machinery Corp.,
 1400 West Ave., Buffalo, N.Y.
Consolidated Prods. Co., 15 Park Row, N.Y.
 (Used) See page 21.
 J. H. Day Co., 1144 Harrison Ave., Cincinnati
 J. L. Ferguson Co., Joliet, Ill.
 B. F. Gump Co., 431 S. Clinton St., Chicago
 S. Howes Co., Silver Creek, N.Y. (Bbls.)
 Johnson Automatic Sealer Co.,
 Battle Creek, Mich.
Newman Tallow & Soap Machy. Co.,
 1051 W. 35th St., Chicago (Used) See page 45.
Pneumatic Scale Corp., Norfolk Downs, Mass.
 See pages 48, 49.
 F. B. Redington Co., 112 S. Sangamon St.,
 Chicago
 C. T. Small Development Co., 212 S. 7th St.,
 St. Louis
Stein-Brill Corp., 183 Varick St., N.Y.
 (New & Used) See page 65.
Stokes & Smith Co., 4915 Summerdale Ave.,
 Phila. See page 66.
 F. J. Stokes Mach. Co., 5974 E. Tabor Rd.,
 Philadelphia
 Triangle Package Machinery Co.,
 906 N. Spaulding Ave., Chicago

FILTER CLOTHS

Abbott Associates, 417 Park Sq. Bldg., Boston
Alsop Engineering Corp., 39 W. 60th St., N.Y.
 See pages 6, 7.
 Cleveland Wire Cloth & Mfg. Co.,
 3574 E. 78th St., Cleveland
 B. F. Gump Co., 431 S. Clinton St., Chicago
 Wm. E. Hooper & Sons Co.,
 Juniper & Cherry Sts., Philadelphia
 Independent Filter Press Co., 189-7th St.,
 Brooklyn
 National Filter & Cloth Weaving Co.,
 220 E. 42nd St., N.Y.
 Newark Wire Cloth Co., 223 Verona Ave.,
 Newark, N. J.
 Oliver United Filters, Inc.,
 33 W. 42nd St., N.Y.
 J. T. Perkins Co., 669 Kent Ave., Brooklyn
 Wm. R. Perrin & Co., 349 W. 23rd St., Chicago
 T. Shriver & Co., Harrison, N. J.
 D. R. Sperry & Co., Batavia, Ill.

FILTER PAPER

Alsop Engineering Corp., 39 W. 60th St., N.Y.
 See pages 6, 7.
 H. Reeve Angel & Co., 7 Spruce St., N.Y.
Aromatic Products, Inc., 15 E. 30th St., N.Y.
 See page 13.
 P. R. Dreyer Inc., 12 E. 12th St., N.Y.
 A. C. Drury & Co., 219 East North Water St.,
 Chicago Ill.
 August Giese & Son, 162 William St., N.Y.
 Karl Kiefer Machine Co., Cincinnati, O.
 Geo. Lueders & Co., 427 Washington St., N.Y.

FILTER PAPER (Cont'd)

Magnus, Mabee & Reynard, 32 Cliff St., N.Y.
 Neumann-Buslee & Wolfe, Inc.,
 224 W. Huron St., Chicago
Orbis Products Corp., 215 Pearl St., N.Y.
 See page 4.
 Palo Co., 81 Reade St., N.Y.
 Scientific Filter Co., 1 Franklin Sq., N.Y.

FILTER PRESSES

Alsop Engineering Corp., 39 W. 60th St., N.Y.
 See pages 6, 7.
Consolidated Prods. Co., 15 Park Row, N.Y.
 (Used) See page 21.
Ertel Engineering Corp., 120 E. 16th St., N.Y.
 See page 27.
 Independent Filter Press Co., 189—7th St.,
 Brooklyn
Newman Tallow & Soap Machy. Co.,
1051 W. 35th St., Chicago (Used)
 See page 45.
 Oliver United Filters, Inc., 33 W. 42nd St., N.Y.
 Patterson Foundry & Machine Co.,
 East Liverpool, Ohio
 Wm. R. Perrin & Co., 349 W. 23rd St., Chicago
 Scientific Filter Co., 1 Franklin Sq., N.Y.
 T. Shriver & Co., Harrison, N. J.
 D. R. Sperry & Co., Batavia, Ill.
Stein-Brill Corp., 183 Varick St., N.Y.
 (Used) See page 65.
 United Filters Corp., Hazelton, Pa.

FILTERS (Special)

Alsop Engineering Corp., 39 W. 60th St., N.Y.
 See pages 6, 7.
Consolidated Prods. Co., 15 Park Row, N.Y.
 (Used) See page 21.
Ertel Engineering Corp., 120 E. 16th St., N.Y.
 See page 27.
 Foster Pump Wks., Inc., 54 Washington St.,
 Brooklyn
 Jacob House & Sons, 52 St. Paul St., Buffalo
 Karl Kiefer Machine Co., Cincinnati
 Lancaster Iron Works, Lancaster, Pa.
 Mixing Equipment Co., 1024 Garson Ave.,
 Rochester, N.Y.
Newman Tallow & Soap Machy. Co.,
1051 W. 35th St., Chicago See page 45.
 Oliver United Filters, Inc., 33 W. 42nd St., N.Y.
 Permutit Co., 330 W. 42nd St., N.Y.
 Scientific Filter Co., 1 Franklin Sq., N.Y.
 T. Shriver & Co., Harrison, N. J.
Stein-Brill Corp., 183 Varick St., N.Y.
 (New & Used) See page 65.
 Struthers, Wells Co., Warren, Pa.
 U. S. Bottlers Mchy. Co.,
 4015 N. Rockwell St., Chicago
 Whiting Corp., Harvey, Ill.

FIRE EXTINGUISHER FLUID

Dow Chemical Co., Midland, Mich. See page 25.
 Grasselli Chem. Co., 629 Euclid Ave., Cleveland
 See page 35.
 Warner Chem. Co., Chrysler Bldg., N.Y.
 See page 70.

FISH OILS

(see also Brokers and Dealers)

Atlantic Products Corp.,
 Commercial Trust Bldg., Phila.
 Atlas Refinery, Lockwood St., Newark, N. J.

Cook Swan Co., 233 Bway., N.Y.
 Falk & Co., Pittsburgh
 Harvey & Outerbridge, 250 Park Ave., N.Y.
 Murray Oil Products Co., 21 West St., N. Y.
 National Oil Prods. Co., Harrison, N.J.
 Pacific Vegetable Oil Co., 82 Thompson St.,
 San Francisco
 Roesling-Monroe Co., 99 Wall St., N.Y.
 Swan Finch Oil Corp., 205 E. 42nd St., N.Y.
 Werner G. Smith Co., 2191 W. 110th St.,
 Cleveland
 Southern Menhaden Corp.,
 350 Madison Ave., N.Y.
Wilbur-Ellis Co., 17 Battery Pl., N. Y.
 See page 71.

FISH OIL SOAPS

James Good, Inc., Kensington, Philadelphia
 See page 34.
 National Oil Products Co., Harrison, N. J.
 Newell Gutradt Co., 350 Fremont St.,
 San Francisco, Cal.
 North Coast Chem. & Soap Works,
 Seattle, Wash.
 Theo. B. Robertson Prods. Co.,
 700 W. Division St., Chicago
 Silmo Chemical Co., Vineland, N.J.
 Werner G. Smith Co., 2191 W. 110th St.,
 Cleveland

FIXATIVES, PERFUME (See ESSENTIAL OILS)**FLAKE SOAPS (see CHIP SOAPS)****FLOATING SOAPS**

Colgate-Palmolive-Peet Co., Jersey City, N. J.
 J. Eavenson & Sons, Camden, N. J.
 Hewitt Soap Co., Dayton, Ohio
 Iowa Soap Co., Burlington, Iowa
 Procter & Gamble Co., Cincinnati
 Geo. A. Schmidt & Co., 236 W. North Ave.,
 Chicago
 Lightfoot Schultz Co., 389—5th Ave., N.Y.
 John T. Stanley Co., 620 W. 30th St., N.Y.
 Allen B. Wisley Co., 6801 W. 65th St.,
 Chicago

FLOOR FINISHES (Non-Wax)

Davies-Young Soap Co., Dayton, O.
 See page 23.
Eagle Soap Corp., Huntington, Ind.
 See page 26.
Federal Varnish Co., 337 S. Peoria St., Chicago
 See page 28.
Fuld Bros., 2308 Frederick Ave., Baltimore
 See page 30.
 T. F. Washburn Co., 2244 Elston Ave.,
 Chicago

FLOOR MACHINES

Amer. Floor Surfacing Mach. Co., Toledo, O.
 Churchill Mfg. Co., 309 Douglas St.,
 Sioux City, Ia.
Eagle Soap Corp., Huntington, Ind.
 See page 26.
 Fay Co., 130 Madison Ave., N.Y.
 Finnell System, Inc., Elkhart, Ind.

FLOOR MACHINES (Cont'd)

General Floor Craft Corp., 333 6th Ave., N.Y.
 Hild Floor Machine Co., 108 W. Lake St.,
 Chicago
 Kent Co., Rome, N.Y.
 S. C. Lawlor Co., 121 N. Curtis St., Chicago
 Lincoln-Schlueter Floor Machine Co.,
 220 W. Grand Ave., Chicago
 Ponsell Floor Machine Co.,
 220 W. 19th St., N.Y.

FLOOR SCRAPERS

A. F. Dormeyer Mfg. Co., 2640 Greenwich Ave.,
 Chicago
 Greenview Mfg. Co., 2557 Greenview Ave.,
 Chicago

FLOOR WAX

American Wax Co., 1325 128th St.,
 College Point, L. I.
 Baums Castorine Co., 200 Mathew St.,
 Rome, N. Y.
 Chemical Compounding Corp., 262 Huron St.,
 Brooklyn
 Chicago Sanitary Prods. Co.,
 2526 W. Congress St., Chicago
 Churchill Mfg. Co., 309 Douglas St.,
 Sioux City, Ia.
 Davies-Young Soap Co., Dayton, O.
 See page 23.
 Eagle Soap Corp., Huntington, Ind.
 See page 26.
 Federal Varnish Co., 337 S. Peoria St.,
 See page 28.
 Franklin Research Co., 5134 Lancaster Ave.,
 Philadelphia
 Fuld Bros., 2308 Frederick Ave., Baltimore
 See page 30.
 Hockwald Chem. Co., 30 Bluxome St.,
 San Francisco
 Hubman Supply Co., 225 N. 4th St.,
 Columbus, O.
 Hunt Mfg. Co., Lisbon Rd., Cleveland
 Palmer Products, Inc., Waukesha, Wis.
 Perrow Chemical Co., Hunt, Va.
 Theo. B. Robertson Prods. Co.,
 700 W. Division St., Chicago
 Solshine Mfg. Co., 44 Brookline St., Cambridge,
 Mass.
 Standard Oil Co. of Calif., San Francisco
 H. F. Staples Co., Medford, Mass.
 Uncle Sam Chemical Co., 329 E. 29th St., N.Y.
 U. S. Sanitary Specialties Corp.,
 435 S. Western Ave., Chicago
 T. F. Washburn Co., 2244 Elston Ave.,
 Chicago
 Windsor Wax Co., Inc., 53 Park Pl., N.Y.

FLOOR WAX (Self-Polishing)

Chemical Compounding Corp., 262 Huron St.,
 Brooklyn
 Chicago Sanitary Prods. Co.,
 2526 W. Congress St., Chicago
 Churchill Mfg. Co., 309 Douglas St.,
 Sioux City, Ia.
 Davies-Young Soap Co., Dayton, O.
 See page 23.
 Eagle Soap Corp., Huntington, Ind.
 See page 26.

Federal Varnish Co., 337 S. Peoria St., Chicago
 See page 28.

Franklin Research Co., 5134 Lancaster Ave.,
 Phila.

Fuld Bros., 2308 Frederick Ave., Baltimore
 See page 30.

Hammond Paint & Chem. Co., Beacon, N.Y.

Hockwald Chem. Co., 30 Bluxome St.,
 San Francisco

Hubman Supply Co., 225 N. 4th St.,
 Columbus, O.

Hunt Mfg. Co., Lisbon Rd., Cleveland

Masury-Young Co., 76 Roland St., Boston

Miracul Wax Co., 1322 Dolman St., St. Louis

Palmer Prods., Inc. Waukesha, Wisc.

Perrow Chem. Co., Hunt, Va.

Theo. B. Robertson Prods. Co.,

700 W. Division St., Chicago

Solshine Mfg. Co., 44 Brookline St., Cambridge,
 Mass.

H. F. Staples Co., Medford, Mass.

Uncle Sam Chemical Co., 329 E. 29th St., N.Y.

U. S. Sanitary Specialties Corp.,

435 S. Western Ave., Chicago

T. F. Washburn Co., 2244 Elston Ave.,
 Chicago

FLUORIDES (see SODIUM FLUORIDE)**FLY SPRAYS (see HOUSEHOLD INSECTI-
CIDE SPRAYS)****FOAMING AGENTS (see SOAP BARK)****FORMALDEHYDE**

(see also Brokers and Dealers)

American Cyanamid & Chem. Corp.,
 30 Rockefeller Plaza, N. Y.

Cliffs-Dow Chem. Co., Marquette, Mich.

Delta Chem. & Iron Co., Wells, Mich.

E. I. Du Pont de Nemours & Co.,

Wilmington, Del.

Grasselli Chemical Co., 1300 Guardian Bldg.,
 Cleveland

See page 35.

Wm. S. Gray Co., 342 Madison Ave., N.Y.

Heyden Chem. Co., 50 Union Sq., N.Y.

Innis, Speiden & Co., 117 Liberty St., N.Y.

See page 40.

Mallinckrodt Chemical Work, St. Louis, Mo.

Merck & Co., Rahway, N. J.

FOSSIL FLOUR (See KIESELGUHR)**FRAMES (Soap)**

Consolidated Prods. Co., 15 Park Row, N.Y.

(Used)

See page 21.

Houchin Machinery Co., Hawthorne, N. J.

See page 37.

Huber Machine Co., 259 46th St., Brooklyn

See page 38.

Littleford Bros., 451 E. Pearl St., Cincinnati

Newman Tallow & Soap Mach. Co.,

1051 W. 35th St., Chicago (New & Used)

See page 45.

Stein-Brill Corp., 183 Varick St., N. Y.

(New & Used)

See page 65.

FULLERS EARTH

American Cyanamid & Chem. Corp.,
30 Rockefeller Plaza, N. Y.
Chas. B. Chrystal Co., 11 Park Pl., N.Y.
A. C. Drury & Co., 219 East North Water St.,
Chicago
Fullers Earth Co., 2049 E. 100th St., Cleveland
Hammill & Gillespie, 225 Broadway, N.Y.
Harshaw Chemical Co., 1945 E. 97th St.,
Cleveland
Industrial Chem. Sales Co., Inc.,
230 Park Ave., N.Y.
Innis, Speiden & Co., 117 Liberty St., N.Y.
See page 40.
Jas. H. Rhodes & Co., 157 W. Austin Ave.,
Chicago
L. A. Salomon & Bro., 216 Pearl St., N.Y.
Tamms Silica Co., 228 N. La Salle St., Chgo.
Whittaker, Clark & Daniels, 245 Front St., N.Y.

FUMIGANTS (Cyanide, etc.)

American-British Chem. Supplies, Inc.,
180 Madison Ave., N.Y. See page 9.
American Cyanamid & Chem. Corp.,
30 Rockefeller Plaza, N.Y.
Calcyanide Co., Box 307, Grand Central Annex,
N.Y.
Carbide & Carbon Chemicals Corp.,
30 East 42nd St., N.Y.
Dow Chemical Co., Midland, Mich.
See page 25.
E. I. Du Pont de Nemours & Co.,
Wilmington, Del.
Innis, Speiden & Co., 117 Liberty St., N.Y.
See page 40.
Mechling Bros. Chemical Co.,
Line St. & Cooper Creek, Camden, N. J.
Michigan Alkali Co., 60 E. 42nd St., N.Y.
Rohm & Haas Co., Inc., 222 W. Washington
Sq., Philadelphia See pages 58, 59.

GAUGES (see INSTRUMENTS)**GERANIOL (see AROMATIC CHEMICALS)****GERANIUM OIL (see ESSENTIAL OILS)****GERANYL ACETATE (see AROMATIC CHEMICALS)****GIFT SETS (see NOVELTY SOAPS and TOILET SOAPS)****GLASS BOTTLES (see BOTTLES)****GLASS JARS (see BOTTLES)****GLUES (see ADHESIVES)****GLYCERINE (Refined)**

Armour & Co., 1355 W. 31st St., Chicago
See page 12.

Century Stearic Acid Candle Wks.,
22 E. 40th St., N. Y.
Colgate-Palmolive-Peet Co., Jersey City, N. J.
Cox, Aspden & Fletcher, 39 Cortlandt St.,
N.Y. (Import)
Harshaw Chemical Co., 1945 E. 97th St.,
Cleveland
Larkin Company, Buffalo, N.Y.
Lever Bros. Co., Cambridge, Mass.
Los Angeles Soap Co., Los Angeles, Calif.
Leo Pasternak, 110 William St., N. Y.
(Brokers)
Procter & Gamble Co., Cincinnati
John T. Stanley Co., 642 W. 30th St., N.Y.
Swift & Co., Union Stock Yards, Chicago
M. Werk Co., St. Bernard, Cincinnati
Allen B. Wrisley Co., 6801 West 65th St.,
Chicago

GLYCERINE DISTILLATION PLANTS

E. B. Badger Co., 25 Pitts St., Boston
William Garrigue & Co., 9 S. Clinton St.,
Chicago
Alan Porter Lee, Inc., 136 Liberty St., N.Y.
See page 41.
Ernest Scott & Co., Fall River, Mass.
Swenson Evaporator Co., Harvey, Ill.
Wurster & Sanger, 5201 Kenwood Ave., Chicago
Zarembo Co., 506 Crosby Bldg., Buffalo, N. Y.

GREASES*(see also Brokers and Dealers)*

Armour & Co., 1355 W. 31st St., Chicago
See page 12.
Belleville Rendering Co., Belleville, Ill.
Consolidated Rendering Co., 40 N. Market St.,
Boston
Cudahy Packing Co., 111 W. Monroe St.,
Chicago
Darling & Co., 4201 S. Ashland Ave., Chicago
Otto A. C. Hagen Co., 929 Ledger Bldg., Phila.
Procter & Gamble Co., Cincinnati
J. H. Redding Co., 17 Battery Pl., N. Y.
Snow & Cleaver, Inc., 15 William St., N.Y.
See page facing 3rd cover.
Louis Stern Sons, Inc., Produce Exchange, N.Y.
Theobald Animal By-Prod. Co., Kearny, N.J.
Toledo Tallow Co., Toledo, Ohio
Waltham Tallow Co., Waltham, Mass.
Wilbur-Ellis Co., 17 Battery Pl., N. Y.
See page 71.
Wilson & Co., Union Stock Yards, Chicago
Wilson-Martin Co., Swanson St., Phila.
Woburn Degreasing Co., 1200 Harrison Ave.,
Harrison, N. J.

GREEN SOAP

Antiseptol Co., 5524 Northwest Highway,
Chicago
Armour Soap Wks., 1355 W. 31st St., Chicago
See page 12.
Baums Castorine Co., 200 Mathew St.,
Rome, N. Y.
Chicago Sanitary Prods. Co.,
2526 W. Congress St., Chicago
Churchill Mfg. Co., 309 Douglas St.,
Sioux City, Ia.
Clifton Chemical Co., 247 Front St., N. Y.
See page 19.

GREEN SOAPS (Cont'd)

- Davies Young Soap Co., Dayton, O.
See page 23.
- Eagle Soap Corp., Huntington, Ind.
See page 26.
- Fuld Bros., 2308 Frederick Ave., Baltimore
See page 30.
- Genseke Bros., West 48th Pl. & Whipple St., Chicago
- James Good, Inc., Kensington, Philadelphia
See page 34.
- Haag Laboratories, Inc., 6101 S. May St., Chicago
- Harley Soap Co., 2832 E. Pacific St., Phila.
- Hockwald Chem. Co., 30 Bluxome St., San Francisco
- H. Kohnstamm, Inc., 91 Park Pl., N.Y.
- Kranich Soap Co., 54 Richards St., Brooklyn
- Laurel Soap Mfg. Co., Tioga, Thompson & Almond Sts., Phila.
- Los Angeles Soap Co., Los Angeles, Calif.
- National Soap Co., Tacoma, Wash.
- New York Soap Corp., 294 Pearl St., N.Y.
See page 44.
- Palmer Products, Inc., Waukesha, Wis.
- Peck's Prods. Co., 522-40 N. 2nd St., St. Louis
- Procter & Gamble Co., Cincinnati
- Theo. B. Robertson Prods. Co., 700 W. Division St., Chicago
- Geo. A. Schmidt Co., 236 W. North Ave., Chicago
- Scholler Bros. & Co., Phila.
- Swift & Co., Union Stock Yards, Chicago
- Tremco Mfg. Co., 393 E. 131st St., Cleveland
- U. S. Sanitary Specialties Corp., 435 S. Western Ave., Chicago
- Warren Soap Mfg. Co., 51 Waverly St., Cambridge, Mass.
- Allen B. Wisley Co., 6801 W. 65th St., Chicago
- Chas. W. Young & Co., Phila.

GRINDING MACHINERY

- Abbe Engineering Co., 50 Church St., N.Y.
- American Pulverizer Co., 18th & Austin Sts., St. Louis
- C. O. Bartlett & Snow Co., 6200 Harvard Ave., Cleveland
- Blanchard Machine Co., 64 State St., Cambridge, Mass.
- Consolidated Prods. Co., 15 Park Row, N.Y.
(Used) See page 21.
- J. H. Day Co., 1144 Harrison Ave., Cincinnati
- Gruendler Patent Crusher & Pulverizer Co., 900 N. First St., St. Louis
- B. F. Gump Co., 431 S. Clinton St., Chicago
- Houchin Machy. Co., Hawthorne, N.J.
See page 37.
- Huber Machine Co., 259 46th St., Brooklyn
See page 38.
- Kent Machine Works, 137 Gold St., Brooklyn
- Lancaster Iron Works, Lancaster, Pa.
- J. M. Lehman Co., 248 W. Broadway, N.Y.
- Newman Tallow & Soap Machy. Co., 1051 W. 35th St., Chicago (Used)
See page 45.
- Olsen & Tilgner Mfg. Co., 2276 Elston Ave., Chicago
- Raymond Bros. Impact Pulverizer Co., 1302 N. Branch St., Chicago
- Chas. Ross & Sons, 150 Classon Ave., Bklyn.
- Patterson Foundry & Machine Co., East Liverpool, O.

Stein-Brill Corp., 183 Varick St., N. Y.
(Used) See page 65.

- Stephens-Adamson Mfg. Co., Aurora, Ill.
- F. J. Stokes Machine Co., Philadelphia, Pa.
- Sturtevant Mill Co., Harrison Sq., Boston
- Williams Patent Crusher & Pulverizer Co., 2709 N. 9th St., St. Louis

GUMS

- American Cyanamid & Chem. Corp., 30 Rockefeller Plaza, N. Y.
- C. W. Campbell Co., 157 Chambers St., N.Y.
- T. G. Cooper & Co., 47 N. 2nd St., Phila.
- A. C. Drury & Co., 219 East North Water St., Chicago, Ill.
- J. L. Hopkins & Co., 220 Broadway, N.Y.
- Hymes Bros. Co., 37 Howard St., N.Y.
- Innis, Speiden & Co., 117 Liberty St., N.Y.
See page 40.
- Murray & Nickell Mfg. Co., 2608 Arthington St., Chicago
- Neuman-Buslee & Wolfe, 224 W. Huron St., Chicago, Ill.
- Orbis Products Corp., 215 Pearl St., N.Y.
See page 4.
- R. J. Prentiss & Co., 100 Gold St., N.Y.
See page 53.
- Stein, Hall & Co., 285 Madison Ave., N.Y.
- Thurston & Braidich, 55 Van Dam St., N.Y.
- G. A. Wharry & Co., 74 State St., N.Y.

GUNS, Powder (see POWDER BLOWERS)**GYM-FINISH FLOOR SEAL**

- Eagle Soap Corp., Huntington, Ind.
See page 26.
- Federal Varnish Co., 337 S. Peoria St., Chicago
See page 28.
- Fuld Bros., 2308 Frederick Ave., Baltimore
See page 30.
- T. F. Washburn Co., 2244 Elston Ave., Chicago

HAND (Mechanic's) SOAP

- Cary Mfg. Co., Joliet, Ill.
- Chicago Sanitary Prods. Co., 2526 W. Congress St., Chicago
- Cincinnati Soap Co., Cincinnati
- Columbia Soap & Chem. Co., Inc., 324 Leavenworth St., San Francisco
- Davies Young Soap Co., Dayton, O.
See page 23.
- Eagle Soap Corp., Huntington, Ind.
See page 26.
- J. Eavenson & Sons, Del. & Penn Sts., Camden, N.J.
- Hewitt Soap Co., Dayton, O.
- R. M. Hollingshead Co., 840 Cooper St., Camden, N.J.
- Hubman Supply Co., 225 N. 4th St., Columbus, O.
- Jansen Soap & Chemical Co., 324 Leavenworth St., San Francisco, Cal.
- Mione Mfg. Co., Collingdale, Pa.
- North Coast Soap & Chem. Wks., Seattle, Wash.
- Palmer Products, Inc., Waukesha, Wis.
- Peck's Prods. Co., 522-40 N. 2nd St., St. Louis
- Procter & Gamble Co., Cincinnati
- Theo. B. Robertson Prods. Co., 700 W. Division St., Chicago
- Geo. A. Schmidt Co., 236 W. North Ave., Chicago
- John T. Stanley Co., 640 W. 30th St., N.Y.

HAND (Mechanics') SOAP (Cont'd)

United Cleanser Mfg. Co., 160 Second St.,
Cambridge, Mass.
Vliet Soap Co., 638 Monroe St., Brooklyn
Allen B. Wrisley Co., 6801 West 65th St.,
Chicago, Ill.

HARDWATER SOAPS (see COCONUT OIL SOAPS)**HELIOTROPIN (See AROMATIC CHEMICALS)****HEXALIN**

E. I. du Pont de Nemours & Co.,
Wilmington, Del.

HOLDERS (Deodorizing Block)

(see also Cans, Fibre)

Chicago Sanitary Prods. Co.,
2526 W. Congress St., Chicago
Cin-Made Corp., (fibre)
294 Eggleston Ave., Cincinnati
Clifton Chemical Co., 247 Front St., N. Y.
See page 19.
Eagle Soap Co., Huntington, Ind.
See page 26.
Fuld Bros., 2308 Frederick Ave., Baltimore
See page 30.
Garnet Chem. Corp., 911 N. Lumber St.,
Allentown, Pa.
Hockwald Chem. Co., 30 Bluxome St.,
San Francisco
Jansen Soap & Chemical Co.,
324 Leavenworth St., San Francisco, Cal.
Palmer Products, Inc., Waukesha, Wis.
Rochester Germicide Co., 16 Dowling Pl.,
Rochester, N.Y.
Sanitary Supplies Co., P. O. Box 5208, Phila.
U. S. Sanitary Specialties Corp.,
435 S. Western Ave., Chicago

HORTICULTURAL SPRAY BASE (See PETROLEUM BASES)**HOUSEHOLD INSECTICIDE BASE (See PETROLEUM BASES)****HOUSEHOLD INSECTICIDES, LIQUID**

An-Fo Mfg. Co., 3129 Elmwood Ave.,
Oakland, Cal.
Antiseptol Co., 5524 Northwest Highway,
Chicago
Baird & McGuire, Inc., Holbrook, Mass.
See pages 14, 15.
Cary Mfg. Co., Joliet, Ill.
Chemical Compounding Corp., 262 Huron St.,
Brooklyn
Chemical Supply Co., 2450 Canal Rd., Cleveland
Chicago Sanitary Prods. Co.,
2526 W. Congress St., Chicago
Churchill Mfg. Co., 309 Douglas St.,
Sioux City, Ia.
Cino Chem. Prods. Co., 210 Main St.,
Cincinnati, O.
Clifton Chemical Co., 247 Front St., N. Y.
See page 19.

Columbia Soap & Chem. Co., Inc.,
324 Leavenworth St., San Francisco
Geo. H. Conn Co., Freeport, Ill.
Creco Co., Inc., Creco Bldg.,
Long Island City, N.Y.
Derris, Inc., 79 Wall St., N.Y. See page 24.
C. B. Dolge Co., Westport, Conn.
Eagle Soap Corp., Huntington, Ind.
See page 26.
Fuld Bros., 2308 Frederick Ave., Baltimore
See page 30.
Globe Sanitary Supply Co., 2249 E. 38th St.,
Los Angeles
James Good, Inc., Kensington, Phila.
See page 34.
Goulard & Olena, 140 Liberty St., N.Y.
Harley Soap Co., 2832 E. Pacific St., Phila.
Hockwald Chem. Co., 30 Bluxome St.,
San Francisco
Hubman Supply Co., 225 N. 4th St.,
Columbus, O.
Hunt Mfg. Co., Lisbon Rd., Cleveland
Industrial Labs., 17-19 Conway St., Baltimore
Jansen Soap & Chem. Co.,
324 Leavenworth St., San Francisco, Cal.
Kemiko Mfg. Co., 191 Murray St.,
Newark, N. J.
Maywood Pest Exterminators, 1206 S. 1st Ave.,
Maywood, Ill.
McCormick & Co., Inc., Baltimore, Md.
See page 72.
Edgar A. Murray Co., 2703 Guoin St., Detroit
Palmer Products, Inc., Waukesha, Wis.
Peck's Prods. Co., 522-40 N. 2nd St., St. Louis
Perrow Chem. Co., Hurt, Va.
Theo. B. Robertson Prods. Co.,
700 W. Division St., Chicago
Selig Co., 336 Marietta St., Atlanta, Ga.
Shores Co., Cedar Rapids, Ia.
Standard Oil Co. of Calif., San Francisco
Uncle Sam Chemical Co., 329 E. 29th St., N.Y.
U. S. Sanitary Specialties Corp.,
435 S. Western Ave., Chicago
Vliet & Co., 638 Monroe St., Brooklyn
White Tar Co., Kearny, N. J.
Robert C. White Co., Falls of Schuylkill,
Phila.

HOUSEHOLD INSECTICIDES, POWDERED

Allaire Woodward & Co., Peoria, Ill.
An-Fo Mfg. Co., 3129 Elmwood Ave.,
Oakland, Cal.
Chemical Supply Co., 2450 Canal Rd., Cleveland
Chicago Sanitary Prods. Co.,
2526 W. Congress St., Chicago
Derris, Inc., 79 Wall St., N.Y. See page 24.
Eagle Soap Corp., Huntington, Ind.
See page 26.
Fuld Bros., 2308 Frederick Ave., Baltimore
See page 30.
Globe Sanitary Supply Co., 2249 E. 38th St.,
Los Angeles
James Good, Inc., Kensington, Philadelphia
See page 34.
Goulard & Olena, Inc., 140 Liberty St., N.Y.
Hockwald Chem. Co., 30 Bluxome St.,
San Francisco
J. L. Hopkins & Co., 220 Broadway, N.Y.
Maywood Pest Exterminators, 1206 S. 1st Ave.,
Maywood, Ill.
McCormick & Co., Inc., Baltimore, Md.
See page 72.

HOUSEHOLD INSECTICIDES, POWDERED (Cont'd)

McLaughlin Gormley King Co.,
1715—5th St., S. E., Minneapolis, Minn.
Edgar A. Murray Co., 2703 Guoin St., Detroit
Palmer Products, Inc., Waukesha, Wis.
S. B. Penick & Co., 132 Nassau St., N.Y.

John Powell & Co., 114 E. 32nd St., N.Y.

Theo. B. Robertson Prods. Co.,
700 W. Division St., Chicago
Ratin Labs., 116 Broad St., N.Y.
Selig Co., 336 Marietta St., Atlanta, Ga.
Shores Co., Cedar Rapids, Ia.
U. S. Sanitary Specialties Corp.,
435 S. Western Ave., Chicago
White Tar Co., Kearny, N. J.

HYDROGENATED OILS

Procter & Gamble Co., Cincinnati, O.
Werner G. Smith Co., 2191 W. 110th St.,
Cleveland
Wesson Oil & Snowdrift Co.,
21 West St., N.Y.
Wyandotte Oil Co., Wyandotte, Mich.

**HYDROGENATION PLANTS (See OIL
HYDROGENATION PLANTS)****HYDROSULFITES (Soap Bleaches)**

American Cyanamid & Chem. Corp.,
30 Rockefeller Plaza, N. Y.
Grasselli Chemical Co., 1300 Guardian Bldg.,
Cleveland
Jungmann & Co., 157 Chambers St., N.Y.
Merrimac Chem. Co., 148 State St., Boston
Rohm & Haas Co., Inc.,
222 W. Washington Sq., Phila.
Royce Chem. Co., Carlton Hill, N.J.

**HYDROXYCITRONELLAL (See AROMATIC
CHEMICALS)****INFUSORIAL EARTH (see KIESELGUHR)****INSECT FLOWERS (See PYRETHRUM)****INSECT POWDER (see PYRETHRUM)****INSECT POWDER GUNS (See BELLOWS)****INSECTICIDE SPRAY PERFUMES**

van Ameringen-Haebler, Inc.,
315—4th Ave., N.Y.
Aromatic Products, Inc., 15 E. 30th St., N.Y.
Ph. Chaleyer, Inc., 200 Varick St., N.Y.
Compagnie Duval, 121 E. 24th St., N.Y.
Compagnie Parento, Croton-on-Hudson, N. Y.
Dodge & Olcott Co., 180 Varick St., N.Y.
P. R. Dreyer Inc., 12 E. 12th St., N.Y.
Evergreen Chemical Co., 160—5th Ave., N.Y.

Felton Chemical Co., 603 Johnson Ave.,
Brooklyn, N.Y.
Chas. Fischbeck Co., 119 W. 19th St., N.Y.
Fritzsch Brothers, Inc., 76 Ninth Ave., N.Y.
Givaudan-Delawanna, Inc., 80—5th Ave., N.Y.

Hymes Bros. Co., 37 Howard St., N.Y.
Geo. Lueders & Co., 427 Washington St., N.Y.
Magnus, Mabree & Reynard, 32 Cliff St., N.Y.
Neumann-Buslee & Wolfe, 224 W. Huron St.,
Chicago

Orbis Products Corp., 215 Pearl St., N.Y.

Pfaltz & Bauer, 300 Pearl St., N.Y.
Polak's Frutal Wks., Inc., 350 W. 31st St., N.Y.
John Powell & Co., 114 E. 32nd St., N.Y.

Riviera Products Co., 215 W. Ohio St.,
Chicago

H. C. Ryland, Inc., 161 Water St., N.Y.
Schimmel & Co., 601 W. 26th St., N.Y.
Wm. G. Sibbach & Co., 201 S. 2nd Ave.,
Maywood, Ill.

George Silver Import Co., 353—4th Ave., N.Y.
Sherwood Petroleum Co., Bush Terminal Bldg.
No. 1, Brooklyn, N.Y.

Synsleur Scientific Labs., Monticello, N.Y.
Ungerer & Co., 13 W. 20th St., N.Y.

Albert Verley, Inc., 11 E. Austin Ave., Chicago

INSECTICIDES, SYNTHETIC

Research Lab., Cedar Rapids, Ia.
Rohm & Haas, Inc.,
222 W. Washington Sq., Phila.

**INSECTICIDE TESTING (see CON-
SULTANTS)****INSTRUMENTS**

Bailey Meter Co., 1050 Ivanhoe Rd., Cleveland
Bausch & Lomb Optical Co., Rochester, N.Y.
Bristol Co., Waterbury, Conn.
Brown Instrument Co.,
Wayne & Windrim Sts., Philadelphia
Buffalo Meter Co., 2890 Main St., Buffalo, N.Y.
G. M. Davis Regulator Co.,
2541 S. Washtenaw, Chicago
Eimer & Amend, 19th St. & 3rd Ave., N.Y.
Foxboro Co., Foxboro, Mass.
Liquidometer Corp., Long Island City, N.Y.
Pneumercator Co., Sperry Bldg., Brooklyn
Precision Thermometer Co.,
1434 Brandywine St., Philadelphia
Republic Flow Meters Co., 2240 Diversey Blvd.,
Chicago
Taylor Instrument Co., Rochester, N.Y.

**IONONE (Violet Base) (See AROMATIC
CHEMICALS)****JAPAN WAX (See WAXES)****JARS, GLASS (See BOTTLES)****JASMIN, ARTIFICIAL (See AROMATIC
CHEMICALS)**

KAOLIN (See CLAYS)**KEROSENE (See PETROLEUM)****KETTLES**

- Alloy Prods. Corp., 221 Madison St.,
Waukesha, Wis.
Also Engineering Corp., 39 W. 60th St., N.Y.
See pages 6, 7.
- Bethlehem Foundry & Machine Co.,
Grand Central Bldg., N.Y.
- Consolidated Prods. Co., 15 Park Row, N.Y.
(Used) See page 21.
- J. H. Day Co., 1144 Harrison Ave., Cincinnati
- Houchin Machinery Co., Hawthorne, N. J.
See page 37.
- Huber Machine Co., 259—46th St., Brooklyn
See page 38.
- Lancaster Iron Works, 564 S. Prince St.,
Lancaster, Pa.
- Littleford Bros., 443 E. Pearl St., Cincinnati
- Newman Tallow & Soap Machy. Co.,
1051 W. 35th St., Chicago (Used)
See page 45.
- Patterson Foundry & Machine Co.,
East Liverpool, O.
- Pfandler Co., 89 East Ave., Rochester, N.Y.
- Sowers Mfg. Co., 1296 Niagara St.,
Buffalo, N.Y.
- Stein-Brill Corp., 183 Varick St., N.Y.
(Used) See page 65.
- F. J. Stokes Mach. Co., Philadelphia, Pa.
- Struthers-Wells Co., Warren, Pa.
- Stuart & Peterson Co., Burlington, N. J.
- H. B. Trout Co., 240 Ohio St., Buffalo, N.Y.

KIESELGUHR (Infusorial Earth)

- American Cyanamid & Chem. Corp.,
30 Rockefeller Plaza, N. Y.
- Chas. B. Chrystal Company, 11 Park Pl., N.Y.
- A. C. Drury & Co., 219 East North Water St.,
Chicago, Ill.
- Hammill & Gillespie, 225 Broadway, N.Y.
- Industrial Chem. Sales Co., Inc.,
230 Park Ave., N.Y.
- Innis, Speiden & Co., 117 Liberty St., N.Y.
See page 40.
- National Prods. Co., 307 W. 8th St.,
Los Angeles
- R. F. Revson Co., 91—7th Ave., N.Y.
- L. A. Salomon & Bro., 216 Pearl St., N.Y.
- Tamms Silica Co., 228 N. La Salle St., Chicago
- Whittaker, Clark & Daniels, 245 Front St., N.Y.
- Wishnick-Tumpeier, Inc., 295 Madison Ave.,
N.Y.

KITS (Wooden) (see PAILS, WOODEN)**LABELING MACHINERY (Bottles)**

- Also Engineering Corp., 39 W. 60th St., N.Y.
See pages 6, 7.
- Burt Machine Co., Baltimore, Md.
- Consolidated Prods. Co., 15 Park Row, N.Y.
(Used) See page 21.
- Economic Machinery Corp., Worcester, Mass.
- Edward Ernold Co., 652-64 Hudson St., N.Y.
- National Labeling Machine Co., 129 W. 19th St.,
Long Island City, N.Y.
- New Jersey Machine Corp., Hoboken, N. J.

Newman Tallow & Soap Machy. Co.,
1051 W. 35th St., Chicago (Used)

Pneumatic Scale Corp., Norfolk Downs, Mass.
See page 45.
See pages 48, 49.

Potdevin Machine Co., 1224—38th St.,
Brooklyn (hand)

F. B. Redington Co., 112 S. Sangamon St.,
Chicago

Stein-Brill Corp., 183 Varick St., N. Y.
(Used) See page 65.

LABELING MACHINES (Boxes & Cakes)

- Consolidated Prods. Co., 15 Park Row, N.Y.
(Used) See page 21.
- New Jersey Machine Corp., Hoboken, N.J.
- Newman Tallow & Soap Machy. Co.,
1051 W. 35th St., Chicago (Used)
See page 45.
- Pneumatic Scale Corp., Norfolk Downs, Mass.
See pages 48, 49.
- Stein-Brill Corp., 183 Varick St., N. Y.
(Used) See page 65.
- Stokes & Smith Co., Summerdale, Phila., Pa.
See page 66.

LABELING MACHINERY (Cans)

- Also Engineering Corp., 39 W. 60th St., N.Y.
See pages 6, 7.
- Burt Machine Co., Baltimore
- Consolidated Prods. Co., 15 Park Row, N.Y.
(Used) See page 21.
- Fred H. Knapp Corp., Ridgewood, N. J.
- J. L. Ferguson Co., Joliet, Ill.
- New Jersey Machine Corp., Hoboken, N.J.
- Newman Tallow & Soap Machy. Co.,
1051 W. 35th St., Chicago (Used)
See page 45.
- Pneumatic Scale Corp., Norfolk Downs, Mass.
See pages 48, 49.
- Potdevin Machine Co., 1224—38th St.,
Brooklyn (hand)
- F. B. Redington Co., 112 S. Sangamon St.,
Chicago
- Stein-Brill Corp., 183 Varick St., N. Y.
(Used) See page 65.

LABELS

- American Lithographic Co., 52 E. 19th St., N.Y.
- Dennison Mfg. Co., Framingham, Mass.
- Foxon Co., Providence, R. I.
- Henderson Lithographing Co., Norwood,
Cincinnati
- R. J. Kittredge Co., 812 W. Superior St.,
Chicago
- U. S. Printing & Litho. Co., Cincinnati, O.

LABORATORIES, CONSULTING (see Consultants)**LABORATORY APPARATUS**

- Central Scientific Co., 460 E. Ohio St., Chicago
- Eimer & Amend, 19th St. & 3rd Ave., N.Y.
- Empire Lab. Supply Co., 559 W. 132nd St., N.Y.
- Fisher Scientific Co., Pittsburgh
- Emil Greiner Co., 55 Van Dam St., N.Y.
- Laboratory Construction Co., 1111 Holmes St.,
Kansas City, Mo.
- Scientific Materials Co., Pittsburgh

LABORATORY APPARATUS (Cont'd)

Arthur H. Thomas Co., Wash Sq., Phila.
Will Corp., Rochester, N.Y.

LABORATORY CHEMICALS

J. T. Baker Chemical Co., Phillipsburg, N. J.
General Chemical Co., 40 Rector St., N.Y.
See page 31.
Jungmann & Co., 157 Chambers St., N.Y.
See inside back cover.
Harshaw Chemical Co., 1945 E. 97th St.,
Cleveland
Mallinckrodt Chemical Works, 3600 N. 2nd St.,
St. Louis
Merck & Co., Rahway, N. J.
Pfaltz & Bauer, Inc., 300 Pearl St., N.Y.
Sterling Products Co., Easton, Pa.

LANOLIN

Bopf-Whittam Corp., Westfield, N.J.
A. C. Drury & Co., 219 East North Water St.,
Chicago, Ill.
Charles L. Huisking, Inc., 155 Varick St., N.Y.
Hummel Chemical Co., 90 West St., N.Y.
Adolphe Hurst & Co., 330 W. 42nd St., N.Y.
Innis, Speiden & Co., 117 Liberty St., N.Y.
See page 40.
Jungmann & Co., 157 Chambers St., N.Y.
See inside back cover.
Merck & Co., Rahway, N. J.
Pfaltz & Bauer, Inc., 300 Pearl St., N.Y.

LAUNDRY BLUE

Fezandie & Sperrle, 205 Fulton St., N.Y.
Interstate Color Co., 5 Beekman St., N.Y.
National Aniline & Chemical Co., 40 Rector St.,
N.Y.
Pylam Products Co., 799 Greenwich St., N.Y.
See page 55

LAUNDRY SOAP, CAKE

Armour Soap Wks., 1355 W. 31st St., Chicago
See page 12.
Cincinnati Soap Co., Cincinnati, O.
Du Bois Soap Co., Cincinnati, O.
J. Eavenson & Sons, Del. & Penn. Sts.,
Camden, N. J.
Fels & Co., Philadelphia
Hewitt Soap Co., Dayton, O.
Lightfoot Schultz Co., 1412 Park Ave.,
Hoboken, N. J.
Los Angeles Soap Co., Los Angeles, Calif.
Manhattan Soap Co., Bristol, Pa.
Geo. E. Marsh Co., 200 Broadway, Cambridge,
Mass.
National Soap Co., 357 S. 25th St.,
Tacoma, Wash.
Newell Guttradt Co., 350 Fremont St.,
San Francisco, Cal.
Peck's Prods. Co., 522-40 N. 2nd St., St. Louis
Procter & Gamble Co., Cincinnati
North Coast Chem. & Soap Wks.,
Seattle, Wash.
John T. Stanley Co., 640 W. 30th St., N.Y.
Swift & Co., Union Stock Yards, Chicago
Vliet Soap Co., 63 Monroe St., Brooklyn
Warren Soap Mfg. Co., 51 Waverly St.,
Cambridge, Mass.
M. Werk Co., St. Bernard, Cincinnati

Allen B. Wrisley Co., 6801 W. 65th St.,
Chicago, Ill.
Chas. W. Young & Co., Phila.

LAUNDRY SOAP, CHIP

Armour Soap Wks., 1355 W. 31st St., Chicago
See page 12.
Cincinnati Soap Co., Cincinnati, O.
Du Bois Soap Co., Cincinnati, O.
J. Eavenson & Sons, Del. & Penn. Sts.,
Camden, N. J.
Harris Soap Co., Buffalo, N.Y.
Haskins Bros. & Co., Sioux City, Iowa
Hewitt Soap Co., Dayton, Ohio
H. Kohnstamm & Co., 91 Park Pl., N.Y.
Lightfoot Schultz Co., 1412 Park Ave.,
Hoboken, N. J.
Los Angeles Soap Co., Los Angeles, Calif.
Geo. E. Marsh Co., 200 Broadway, Cambridge,
Mass.
Nat'l Milling & Chem. Co., Manayunk, Phila.
National Soap Co., 357 South 25th St.,
Tacoma, Wash.
North Coast Soap & Chem. Wks.,
Seattle, Wash.
Peck's Prods. Co., 522-40 N. 2nd St., St. Louis
Procter & Gamble Co., Cincinnati
John T. Stanley Co., 640 W. 30th St., N.Y.
Swift & Co., Union Stock Yards, Chicago
Warren Soap Mfg. Co., 51 Waverly St.,
Cambridge, Mass.
M. Werk Co., St. Bernard, Cincinnati
Allen B. Wrisley Co., 6801 W. 65th St.,
Chicago, Ill.
Chas. W. Young & Co., Phila.

LAUNDRY SOAP, POWD. AND GRAN.

American Soap Powder Wks.,
100 Van Dyke St., Brooklyn, N.Y.
Armour Soap Wks., 1355 W. 31st St., Chicago
See page 12.
Du Bois Soap Co., Cincinnati, O.
J. Eavenson & Sons, Del. & Penn. Sts.,
Camden, N. J.
Hewitt Soap Co., Dayton, Ohio
H. Kohnstamm & Co., 91 Park Pl., N.Y.
Lever Bros. Co., Cambridge, Mass.
Los Angeles Soap Co., Los Angeles, Calif.
Geo. E. Marsh Co., 200 Broadway, Cambridge,
Mass.
Nat'l Milling & Chem. Co., Manayunk, Phila.
National Soap Co., 357 South 25th St.,
Tacoma, Wash.
North Coast Soap & Chem. Wks.,
Seattle, Wash.
Paper Makers Chemical Corp.,
Kalamazoo, Mich.
Peck's Prods. Co., 522-40 N. 2nd St., St. Louis
Procter & Gamble Co., Cincinnati
John T. Stanley Co., 640 W. 30th St., N.Y.
Swift & Co., Union Stock Yards, Chicago
Warren Soap Mfg. Co., 51 Waverly St.,
Cambridge, Mass.
Allen B. Wrisley Co., 6801 W. 65th St.,
Chicago, Ill.
Chas. W. Young & Co., Phila.

LAUNDRY SODA, see SODA

LAUNDRY SOURS (Fluoride)

- American Cyanamid & Chem. Corp.,
30 Rockefeller Plaza, N.Y.
American Fluoride Corp.,
151 W. 19th St., N.Y.
Bowker Chem. Co., 50 Church St., N.Y.
Harshaw Chemical Co., 1945 E. 97th St.,
Cleveland
Hummel Chem. Co., 90 West St., N.Y.
Innis, Speiden & Co., 117 Liberty St., N.Y.
See page 40.
Jungmann & Co., 157 Chambers St., N.Y.
See inside back cover.
H. Kohnstamm & Co., 91 Park Pl., N.Y.
Pfaltz & Bauer, Inc., 300 Pearl St., N.Y.
Victor Chemical Wks., 141 W. Jackson Blvd.,
Chicago

LAURYL ALCOHOL

- E. I. du Pont de Nemours & Co., Inc.,
Wilmington, Del. See page facing page 1.
Michel Export Co., 95 Broad St., N.Y.

LAVENDER OIL (See ESSENTIAL OILS)**LEAD ARSENATE**

- Bowker Chemical Co., 50 Church St., N.Y.
Dow Chemical Co., Midland, Mich. See page 25.
General Chemical Co., 40 Rector St., N.Y.
See page 31.

LECITHIN

- American Lecithin Corp., Corona Ave.,
Elmhurst, L. I.
Digestive Ferments Co., 920 Henry St., Detroit
R. W. Greeff & Co., 10 E. 40th St., N.Y.
Elmhurst, L. I.
Jungmann & Co., 157 Chambers St., N.Y.
See inside back cover.
Pfaltz & Bauer, Inc., 300 Pearl St., N.Y.
Wilson Labs., 4221 S. Western Blvd., Chicago

LEMON OIL (See ESSENTIAL OILS)**LEMONGRASS OIL (See ESSENTIAL OILS)****LIME SULFUR**

- Allen Co., Pittstown, N. J.
Dow Chemical Co., Midland, Mich. See page 25.
Grasselli Chemical Co., Guardian Bldg.,
Cleveland See page 35.

LINALOE OIL (See ESSENTIAL OILS)**LINALOOL (See AROMATIC CHEMICALS)****LINALYL ACETATE (See AROMATIC CHEMICALS)****LINERS (see BAG LINERS, BARREL LINERS, ETC.)****LINING MACHINERY (Cartons)**

- Pneumatic Scale Corp., Norfolk Downs, Mass.
See pages 48, 49
F. B. Redington Co., 112 S. Sangamon St.,
Chicago

LINSEED OIL(see also *Brokers and Dealers*)

- Archer-Daniels-Midland Corp.,
Minneapolis, Minn.
William O. Goodrich Co., Milwaukee, Wis.
Spencer Kellogg & Sons, Buffalo, N.Y.
Kelloggs & Miller, Amsterdam, N.Y.
Minnesota Linseed Oil Co.,
Minneapolis, Minn.

LINSEED OIL SOAP

- Baums Castorine Co., 200 Mathew St.,
Rome, N.Y.
Churchill Mfg. Co., 309 Douglas St.,
Sioux City, Ia.
Clifton Chemical Co., 247 Front St., N.Y.
See page 19.
Davies-Young Soap Co., Dayton, O. See page 23.
Eagle Soap Corp., Huntington, Ind. See page 26.
Fuld Bros., 2308 Frederick Ave., Baltimore See page 30.
Genseke Bros., West 48th Pl. & Whipple St.,
Chicago
James Good, Inc., Kensington, Philadelphia See page 34.
Haag Laboratories, Inc., 6101 S. May St.,
Chicago
Harley Soap Co., 2832 E. Pacific St., Phila.
Hockwald Chemical Co., 30 Bluxome St.,
San Francisco
Hunt Mfg. Co., Lisbon Rd., Cleveland
Jansen Soap & Chemical Co.,
324 Leavenworth St., San Francisco, Cal.
H. Kohnstamm & Co., 91 Park Pl., N.Y.
Kranieh Soap Co., 54 Richard St.,
Brooklyn, N.Y.
Laurel Soap Mfg. Co., Tioga & Almond Sts.,
Philadelphia
Newell Gutradt Co., 350 Fremont St.,
San Francisco, Calif.
New York Soap Corp., 294 Pearl St., N.Y.
See page 44.
North Coast Chem. & Soap Wks., Seattle,
Wash.
Palmer Products, Inc., Waukesha, Wis.
Peck's Prods. Co., 522-40 N. 2nd St., St. Louis
Geo. A. Schmidt Co., 236 W. North Ave.,
Chicago, Ill.
Theo. B. Robertson Prods. Co.,
700 W. Division St., Chicago
Tremco Mfg. Co., 393 E. 131st St., Cleveland
John T. Stanley Co., 640 W. 30th St., N.Y.
U. S. Sanitary Specialties Corp.,
435 S. Western Ave., Chicago
Warren Soap Mfg. Co., 51 Waverly St.,
Cambridge, Mass.
Chas. W. Young & Co., Phila.

LIQUID SOAP BASE

- Antiseptol Co., 5524 Northwest Highway,
Chicago
Armour Soap Wks., 1355 W. 31st St., Chicago
See page 12.
Baums Castorine Co., 200 Mathew St.,
Rome, N.Y.
Chicago Sanitary Prods. Co.,
2526 W. Congress St., Chicago
Churchill Mfg. Co., 309 Douglas St.,
Sioux City, Ia.

LIQUID SOAP BASE (Cont'd)

Cincinnati Soap Co., Cincinnati
Clifton Chemical Co., 247 Front St., N.Y.
 See page 19.
 Columbia Soap & Chem. Co., Inc., 217 Clara St.,
 San Francisco
 James Counts Soap Co., 2nd & Washington
 Ave., St. Louis
Davies-Young Soap Co., Dayton, O.
 See page 23.
Eagle Soap Corp., Huntington, Ind.
 See page 26.
Fuld Bros., 2308 Frederick Ave., Baltimore
 See page 30.
James Good, Inc., Kensington, Philadelphia
 See page 34.
 Harley Soap Co., 2832 E. Pacific St., Phila.
 Hubman Supply Co., 225 N. 4th St.,
 Columbus, O.
 Hunt Mfg. Co., Lisbon Rd., Cleveland
 Jansen Soap & Chemical Co.,
 324 Leavenworth St., San Francisco, Cal.
 Los Angeles Soap Co., Los Angeles, Calif.
 H. Kohnstamm & Co., 91 Park Pl., N.Y.
 Kranich Soap Co., 54 Richards St., Brooklyn
 Laurel Soap Mfg. Co., Tioga & Almond Sts.,
 Philadelphia
 Masury-Young Co., 76 Roland St., Boston
 National Oil Products Co., Harrison, N. J.
 National Soap Co., 357 South 25th St.,
 Tacoma, Wash.
New York Soap Co., 294 Pearl St., N.Y.
 See page 44.
 North Coast Chemical & Soap Wks.,
 Seattle, Wash.
 Palmer Products, Inc., Waukesha, Wis.
 Peck's Prods. Inc., 522-40 N. 2nd St., St. Louis
 Procter & Gamble Co., Cincinnati
 Theo. B. Robertson Prods. Co.,
 700 W. Division St., Chicago
 Geo. A. Schmidt Co., 236 W. North Ave.,
 Chicago
 Selig Co., 336 Marietta St., Atlanta, Ga.
 Tremco Mfg. Co., 393 E. 131st St., Cleveland
 U. S. Sanitary Specialties Corp.,
 435 S. Western Ave., Chicago
 Warren Soap Mfg. Co., 51st Waverly St.,
 Cambridge, Mass.
 Allen B. Wrisley Co., 6801 W. 65th St.,
 Chicago

LIQUID SOAP COLORS*(see also Perfuming Compounds)*

American Aniline Products, Inc.,
 50 Union Sq., N.Y.
 Dyestuffs & Chemical, Inc.,
 11th & Monroe Sts., St. Louis
 Fezandie & Sperrle, 205 Fulton St., N.Y.
 Interstate Color Co., Inc., 5 Beekman St., N.Y.
 Leebein Chem. Co., 389 Washington St., N.Y.
Pylam Products Co., 799 Greenwich St., N.Y.
 See page 55.
 Sandoz Chem. Wks., 61 Van Dam St., N.Y.

LIQUID SOAP PERFUMES

van Ameringen-Haebler, Inc.,
 315-4th Ave., N.Y. See pages 10, 11.
Aromatic Products, Inc., 15 E. 30th St., N.Y.
 See page 13.
 Ph. Chaleyer, Inc., 200 Varick St., N.Y.
 Antoine Chiris Co., 147 Waverly Pl., N.Y.
 Compagnie Duval, 121 E. 24th St., N.Y.

Compagnie Parento, Inc.,
 Croton-on-Hudson, N.Y.
 Dodge & Olcott Co., 180 Varick St., N.Y.
 P. R. Dreyer Inc., 12 E. 12th St., N.Y.
 A. C. Drury & Co., 219 East North Water St.,
 Chicago
E. I. du Pont de Nemours & Co., Inc.,
Wilmington, Del. See page facing page 1.
 Evergreen Chemical Co., 160 Fifth Ave., N.Y.
Felton Chemical Co., 603 Johnson Ave.,
Brooklyn See page 29.
 Chas. Fischbeck Co., 119 W. 19th St., N.Y.
 Fritzsche Brothers, Inc., 76 Ninth Ave., N.Y.
Givaudan-Delawanna, Inc., 80-5th Ave., N.Y.
 See inside front cover, 33.
 Hynes Bros. Co., 37 Howard St., N.Y.
 Industrial Organics, 151 W. 25th St., N.Y.
 Lautier Fils, 158 W. 18th St., N.Y.
 Pierre Lemoine, Inc., 62 Watts St., N.Y.
 Geo. Lueders & Co., 427 Washington St., N.Y.
 Magnus, Mabey & Reynard, 32 Cliff St., N.Y.
 A. Maschmeijer, Jr., Inc., 43 W. 16th St., N.Y.
 Neuman-Buslee & Wolfe,
 224 W. Horn St., Chicago
Orbis Products Corp., 215 Pearl St., N.Y.
 See page 4.
 Polak's Frutal Wks., Inc., 350 W. 31st St., N.Y.
 Riviera Products Co., 215 W. Ohio St., Chicago
 H. C. Ryland, Inc., 161 Water St., N.Y.
 Schimmel & Co., 601 W. 26th St., N.Y.
 C. A. Seguin Co., 500 N. Dearborn St., Chi.
 Wm. G. Sibbach & Co., 201 S. 2nd Ave.,
 Maywood, Ill.
 Synflour Scientific Labs., Monticello, N.Y.
Ungerer & Co., 13 W. 20th St., N.Y.
 See page facing inside front cover, 68.
 Albert Verley, Inc., 11 E. Austin Ave., Chicago
 See page 69.

LIQUID SOAPS*(see also Medicinal Soaps, Coconut Oil Soaps, etc.)*

Antiseptol Co., 5524 Northwest Highway,
 Chicago
Armour Soap Wks., 1355 W. 31st St., Chicago
 See page 14.
 Baums Castorine Co., 20 Mathew St.,
 Rome, N.Y.
 Chicago Sanitary Prods. Co.,
 2526 W. Congress St., Chicago
Clifton Chemical Co., 247 Front St., N.Y.
 See page 19.
 Colgate-Palmolive-Peet Co., Jersey City, N.J.
 Columbia Soap & Chem. Co., Inc., 217 Clara St.,
 San Francisco
 James Counts Soap Co.,
 2nd & Washington Ave., St. Louis.
Davies-Young Soap Co., Dayton, O.
 See page 23.
 Diamond Soap Co., 1 Lowden St.,
 Elizabeth, N. J.
Eagle Soap Corp., Huntington, Ind.
 See page 26.
 J. Eavenson & Sons, Del. & Penn Sts.,
 Camden, N.J.
Fuld Bros., 2308 Frederick Ave., Baltimore
 See page 30.
James Good, Inc., Kensington, Philadelphia
 See page 34.
 Green Oil Soap Co., 166 N. Curtis St., Chicago
 Haag Laboratories, Inc., 6101 S. May St.,
 Chicago
 Harley Soap Co., 2832 E. Pacific St., Phila.

LIQUID SOAPS (Cont'd)

Hockwald Chemical Co., 30 Bluxome St.,
San Francisco
Hubman Supply Co., 225 N. 4th St.,
Columbus, O.
Hunt Mfg. Co., Lisbon Rd., Cleveland
H. Kohnstamm & Co., 91 Park Pl., N.Y.
Kranich Soap Co., 54 Richards St., Brooklyn
Laurel Soap Mfg. Co., Tioga & Almond Sts.,
Philadelphia
Los Angeles Soap Co., Los Angeles
Masury-Young Co., 76 Roland St., Boston
New York Soap Corp., 294 Pearl St., N.Y.
See page 44.
North Coast Chem. & Soap Wks.,
Seattle, Wash.
Palmer Products, Inc., Waukesha, Wis.
Paper Makers Chemical Corp.,
Kalamazoo, Mich.
Peck's Prods. Co., 522-40 N. 2nd St., St. Louis
Procter & Gamble Co., Cincinnati
Theo. B. Robertson Prod. Co.,
700 W. Division St., Chicago
Geo. A. Schmidt Co., 236 W. North Ave.,
Chicago
Selig Co., 336 Marietta St., Atlanta, Ga.
Shores Co., Cedar Rapids, Ia.
John T. Stanley Co., 640 W. 30th St., N.Y.
Swift & Co., Union Stock Yards, Chicago
Tremco Mfg. Co., 303 E. 131st St., Cleveland
U. S. Sanitary Specialties Corp.,
435 S. Western Ave., Chicago
Warren Soap Mfg. Co., 51 Waverly St.,
Cambridge, Mass.
Allen B. Wrisley Co., 6801 W. 65th St.,
Chicago, Ill.
Chas. W. Young & Co., Phila.

MACHINERY (USED) (see USED MACHINERY)**MAGNESIUM STEARATE (see STEARATES)****MARSEILLES SOAP (see TEXTILE SOAPS, OLIVE OIL SOAPS)****MECHANIC'S SOAP (see HAND SOAP)****MEDICINAL SOAPS, CAKE**

Armour Soap Wks., 1355 W. 31st St., Chicago
See page 12.
Cincinnati Soap Co., Cincinnati
J. Eavenson & Sons, Del. & Penn. Sts.,
Camden, N. J.
Hewitt Soap Co., Dayton, O.
Los Angeles Soap Co., Los Angeles
Newell Gutrad Co., 350 Fremont St.,
San Francisco, Cal.
Peck's Prods. Co., 522-40 N. 2nd St., St. Louis
Geo. A. Schmidt Co., 236 W. North Ave.,
Chicago
John T. Stanley Co., 640 W. 30th St., N.Y.
Allen B. Wrisley Co., 6801 W. 65th St.,
Chicago

MEDICINAL SOAPS, LIQUID

Antiseptol Co., 5524 Northwest Highway,
Chicago

Armour Soap Wks., 1355 W. 31st St., Chicago
See page 12.

Chicago Sanitary Prods. Co.,
2526 W. Congress St., Chicago
Cincinnati Soap Co., Cincinnati
Clifton Chemical Co., 247 Front St., N.Y.
See page 19.

Eagle Soap Corp., Huntington, Ind.
See page 26.

J. Eavenson & Sons, Del. & Penn. Sts.,
Camden, N. J.
Fuld Bros., 2308 Frederick Ave., Baltimore
See page 30.

James Good, Inc., Kensington, Philadelphia
See page 34.

Hunt Mfg. Co., Lisbon Rd., Cleveland
Jansen Soap & Chemical Co.,
324 Leavenworth St., San Francisco, Cal.
H. Kohnstamm & Co., 91 Park Pl., N.Y.
Kranich Soap Co., 54 Richards St., Brooklyn
Los Angeles Soap Co., Los Angeles
New York Soap Corp., 294 Pearl St., N.Y.
See page 44.

Palmer Products, Inc., Waukesha, Wis.
Peck's Prods. Co., 522-40 N. 2nd St., St. Louis
Theo. B. Robertson Prods. Co.,
700 W. Division St., Chicago
Geo. A. Schmidt Co., 236 W. North Ave.,
Chicago
Shores Co., Cedar Rapids, Ia.
U. S. Sanitary Specialties Corp.,
435 S. Western Ave., Chicago
Warren Soap Mfg. Co., 51 Waverly St.,
Cambridge, Mass.
Allen B. Wrisley Co., 6801 W. 65th St.,
Chicago

MENTHOL

(see also Essential Oils)

Aromatic Products, Inc., 15 E. 30th St., N.Y.
See page 13.

H. J. Baker & Bros., 271 Madison Ave., N.Y.
S. W. Bridges & Co., 70 Pine St., N.Y.
A. C. Drury & Co., 219 East North Water St.,
Chicago

Hosken & Co., 56 Pine St., N.Y.
Magnus, Mabee & Reynard, Inc.,
32 Cliff St., N.Y.

McKesson & Robbins, Inc., 79 Cliff St., N.Y.
Mitsui & Co., 350-5th Ave., N.Y.
Orbis Products Corp., 215 Pearl St., N.Y.

R. J. Prentiss & Co., 100 Gold St., N.Y.
See page 4.
See page 53.

Sherka Chemical Co., 86 Orange St.,
Bloomfield, N.J.
S. Suzuki & Co., 230 Park Ave., N.Y.

MERCURY BICHLORIDE (Corrosive Sublimite)

General Chem. Co., 40 Rector St., N.Y.
See page 31.

Heyden Chemical Corp., 50 Union Sq., N.Y.
Mallinckrodt Chemical Works, St. Louis
Merck & Co., Rahway, N. J.
New York Quinine & Chem. Wks.,
N. 11th & Berry Sts., Brooklyn
Chas. Pfizer & Co., 81 Maiden Lane, N.Y.

METAL CAPS (see CAPS, METAL)**METAL POLISH** (see POLISH, METAL)**METERS** (see INSTRUMENTS)**METHYL ANTHRANILATE**

(see also Aromatic Chemicals)

Dow Chemical Co., Midland, Mich. See page 25.
 Van Dyk & Co., 57 Wilkinson Ave.,
 Jersey City, N.J.

METHYL SALICYLATE (Artificial
Wintergreen)

(see also Aromatic Chemicals)

Dow Chemical Co., Midland, Mich. See page 25.
 Heyden Chemical Corp., 50 Union Sq., N.Y.
 Merck & Co., Rahway, N.J.
 Monsanto Chemical Works, 1724 S. 2nd St.,
 St. Louis

MILLS, COLLOID

Abbe Engineering Co., 50 Church St., N.Y.
 J. H. Day Co., 1144 Harrison Ave., Cincinnati
 Travis Colloid Research Co., 119 Broad St.,
 N.Y.
 U. S. Colloid Mill Corp., 13th St. & East Ave.,
 L. I. City, N.Y.

MILLS, PEBBLE (See GRINDING
MACHINERY)**MILLS, SOAP POWDER**

Abbe Engineering Co., 50 Church St., N.Y.
 Consolidated Prods. Co., 15 Park Row, N.Y.
 (Used) See page 21.
 Houchin Machinery Co., Hawthorne, N. J.
 See page 37.
 J. M. Lehmann Co., 250 W. Broadway, N.Y.
 Newman Tallow & Soap Machy. Co.,
 1051 W. 35th St., Chicago (Used) See page 45.
 Patterson Foundry & Mach. Co.,
 E. Liverpool, Ohio
 Stein-Brill Corp., 183 Varick St., N.Y.
 (New & Used) See page 65.

MILLS, TOILET SOAP

Consolidated Prods. Co., 15 Park Row, N.Y.
 (Used) See page 21.
 Houchin Machinery Co., Hawthorne, N. J.
 See page 37.
 Huber Machine Co., 259—46th St., Brooklyn
 See page 38.
 J. M. Lehmann Co., 250 W. Broadway, N.Y.
 Newman Tallow & Soap Machy. Co.,
 1051 W. 35th St., Chicago (Used) See page 45.
 Stein-Brill Corp., 183 Varick St., N.Y.
 (Used) See page 65.

MINERAL OIL, WHITE, see WHITE
MINERAL OIL**MINERAL SOAP STOCK**, see
PETROLATUM**MIRBANE OIL** (Nitrobenzene)

(see also Essential Oils)

Calo Chemical Co., Bound Brook, N. J.
 E. I. du Pont de Nemours & Co., Inc.,
 Wilmington, Del. See page facing page 1.
 Monsanto Chemical Works, 1724 S. 2nd St.,
 St. Louis
 National Aniline & Chemical Co.,
 40 Rector St., N.Y.
 Naugatuck Chemical Co., 1790 Broadway, N.Y.

MIXERS (Portable)

Alsop Engineering Corp., 39 W. 60th St., N.Y.
 See page 6, 7.
 Consolidated Prods. Co., 15 Park Row N.Y.
 (Used) See page 21.
 Ertel Eng. Co., 120 E. 16th St., N.Y.
 See page 27.
 Houchin Machinery Co., Hawthorne, N. J.
 See page 37.
 Huber Machine Co., 259—46th St., Brooklyn
 See page 38.
 Frank B. Lomax Co., 365 W. Oak St., Chgo.
 Mixing Equipment Co., Inc., 1024 Garson Ave.,
 Rochester, N.Y.
 Newman Tallow & Soap Machy. Co.,
 1051 W. 35th St., Chicago, (New & Used)
 See page 45.
 Patterson Fdy. & Mch. Co., E. Liverpool, O.
 Stein-Brill Corp., 183 Varick St., N.Y.
 (Used) See page 65.

MIXING MACHINERY (Change Can)

Abbe Engineering Co., 50 Church St., N.Y.
 Arthur Colton Co., Detroit, Mich.
 Consolidated Prods. Co., 15 Park Row, N.Y.
 (Used) See page 21.
 J. H. Day Co., 1144 Harrison Ave., Cincinnati
 Huber Machine Co., 259—46th St., Brooklyn
 See page 38.
 Kent Machine Works, 39 Gold St., Brooklyn
 Newman Tallow & Soap Machy. Co.,
 1051 W. 35th St., Chicago (Used) See page 45.
 Patterson Foundry & Mch. Co.,
 E. Liverpool, Ohio
 Chas. Ross & Son Co.,
 150 Classon Ave., Brooklyn
 Stein-Brill Corp., 183 Varick St., N.Y.
 (Used) See page 65.
 Vol-U-Meter Co., 707 Ohio St., Buffalo, N.Y.
 Waterville Fndry. & Machine Co.,
 Waterville, N.Y.

MIXING MACHINERY (Dry Products)

Abbe Engineering Co., 50 Church St., N.Y.
 Besser Mfg. Co., Alpena, Mich.
 Blystone Mfg. Co., Cambridge Springs, Pa.
 Chain Belt Co., Milwaukee, Wis.
 Consol. Concrete Machinery Corp.,
 Adrian, Mich.
 Consolidated Prods. Co., 15 Park Row, N.Y.
 (Used) See page 23.
 Construction Machinery Co., Waterloo, Iowa

MIXING MACHINERY (Dry Products)
(Cont'd)

J. H. Day Co., 1144 Harrison Ave., Cincinnati
W. E. Dunn Mfg. Co., Holland, Mich.
J. B. Foote Foundry Co., Frederickstown, O.
B. F. Gump Co., 431 S. Clinton St., Chicago
Houchin Machy. Co., Hawthorne, N.J.

See page 37.

S. Howes Co., Inc., Silver Creek, N.Y.

Huber Machine Co., 259—46th St., Brooklyn

See page 38.

E. B. Kelley Co., 43-87 Vernon Ave., L. I. City
Koehring Co., 31st St. and Concordia Ave.,
Milwaukee, Wis.

Lancaster Iron Works, Lancaster, Pa.

Lansing Co., Lansing, Mich.

MacLellan Mixer Co., Owensboro, Ky.

Newmann Tallow & Soap Machinery Co.,
1051 W. 35th St., Chicago (Used)

See page 45.

Ransome Concrete Machinery Co.,

Dunellen, N. J.

Republic Iron Works, Tecumseh, Mich.

Chas. Ross & Son Co., 150 Classon Ave.,
Brooklyn

T. L. Smith Co., Milwaukee, Wis.

Stein-Brill Corp., 183 Varick St., N.Y.

(Used)

See page 65.

Stephens-Adamson Mfg. Co., Aurora, Ill.

F. J. Stokes Machine Co., Philadelphia, Pa.

Struthers-Wells Corp., Warren, Pa.

Aurelio Tanzi Engineering Co., 235—4th Ave.,
N.Y.

MIXING MACHINERY (General)

Also Engineering Corp., 39 W. 60th St., N.Y.

See pages 6, 7.

Baker-Perkins Co., 250 Park Ave., N.Y.

Beach-Russ Co., 50 Church St., N.Y.

Arthur Colton Co., Detroit

Consolidated Prods. Co., 15 Park Row, N.Y.

(Used)

See page 21.

J. H. Day Co., 1144 Harrison Ave., Cincinnati

Houchin Machy. Co., Hawthorne, N.J.

See page 37.

S. Howes Co., Inc., Silver Creek, N.Y.

Huber Machine Co., 259—46th St., Brooklyn

See page 38.

Kent Machine Works, 37 Gold St., Brooklyn

Lancaster Iron Works, Lancaster, Pa.

J. M. Lehmann Co., 248 West B'way, N.Y.

Littleford Bros., 443 E. Pearl St., Cincinnati

Mixing Equipment Co., Inc., 1024 Garson Ave.,
Rochester, N.Y.

Newman Tallow & Soap Machy. Co.,

1051 W. 35th St., Chicago (Used)

See page 45.

Patterson Foundry & Mach. Co.,

East Liverpool, Ohio

Pfaudler Co., 89 East Ave., Rochester, N.Y.

Read Machinery Co., York, Pa.

Chas. Ross & Son Co.,

150 Class Ave., Brooklyn

Ernest Scott & Co., Fall River, Mass.

Sowers Mfg. Co., 1296 Niagara St.,

Buffalo, N.Y.

Stein-Brill Corp., 183 Varick St., N.Y.

(Used)

See page 65.

F. J. Stokes Mach. Co., Philadelphia, Pa.

Struthers-Wells Co., Warren, Pa.

Turbo Mixer Corp., 247 Park Ave., N.Y.

Vol-U-Meter Co., 210 Ohio St., Buffalo, N.Y.

Waterville Foundry & Machine Co.,

Waterville, N.Y.

**MIXING TANKS (see TANKS, WOODEN,
STEEL and GLASS, MIXING)****MONEL METAL EQUIPMENT**

International Nickel Co., 67 Wall St., N.Y.

**MONOCHLOROBENZENE (see SOLVENTS,
ORGANIC)****MONTAN WAX (See WAXES)****MOP HANDLES**

Algoma Mfg. Co., Green Bay, Wis.

Amer. Standard Mfg. Co., 2509 Lime St.,
Chicago

Stanley H. Coffin, 12 Pearl St., Boston

Continental Car-Na-Var Corp., Brazil, Ind.

Eagle Woodenware Mfg. Co., Hamilton, O.

Erie Mop & Wringer Co., East Syracuse, N.Y.

Howard Dustless Duster Co., Boston

W. E. Kautenberg Co., Freeport, Ill.

Massasoit Mfg. Co., 233 B'way., N.Y.

Palmer Prods., Inc., Waukesha, Wis.

Sanitary Mfg. Co., 926 Ft. Wayne Ave.,

Indianapolis

Silver-Chamberlin Co., Clayton, NY.

MOP WRINGERS AND PAILS

Stanley H. Coffin, 12 Pearl St., Boston

Colson Mfg. Co., Elyria, O.

Dobbins Mfg. Co., North St. Paul, Minn.

Eagle Woodenware Mfg. Co., Hamilton, Ohio

Economy Mop Wringer Co., 1942 W. 21st St.,
Chicago

Geuder, Paesche & Frey, Milwaukee, Wis.

Illinois Duster Co., 1944 Webster Ave., Chgo.

S. C. Lawlor Co., 124 N. Curtis St., Chicago

Muskegon Sanitary Supply Co.,

Muskegon Heights, Mich.

Palmer Prods., Inc., Waukesha, Wis.

Sanitary Mfg. Co., 926 Ft. Wayne Ave.,

Indianapolis

Tarbox Lever Corp., 61 Chandler St., Buffalo

White Mop Wringer Co., Fultonville, N.Y.

MOPPING TANKS AND TRUCKS

Eagle Woodenware Mfg. Co., Hamilton, O.

S. C. Lawlor Co., 124 N. Curtis St., Chicago

F. H. Lawson Co., Cincinnati

Palmer Prods., Inc., Waukesha, Wis.

White Mop Wringer Co., Fultonville, N.Y.

MOPS

Alabama Broom & Mattress Co.,

Huntsville, Ala.

Algoma Mfg. Co., Green Bay, Wis.

Amer. Standard Mfg. Co., 2509 Lime St.,
Chicago

Burdett-Rose Mfg. Co., 6100 Independence Rd.,
Kansas City, Mo.

California Cotton Mills Co., Oakland, Calif.

Chattanooga Broom & Mop Co.,

Chattanooga, Tenn.

Clark Bros. Mfg. Co., 34 N. Front St., Phila.

Stanley H. Coffin, 12 Pearl St., Boston, Mass.

Continental Car-Na-Var Corp., Brazil, Ind.

Eagle Woodenware Mfg. Co., Hamilton, O.

Howard Dustless Duster Co., Boston, Mass.

W. E. Kautenberg Co., P. O. Box 255,

Freeport, Ill.

MOPS (Cont'd)

Klenzall Mfg. Co., Atlanta, Ga.
 Palmer Prods., Inc., Waukesha, Wis.
 Pioneer Mfg. Co., Cleveland, Ohio
 Ruben Woodfin'g & Prod. Co., 500 W. 7th St.,
 Kansas City, Mo.
 Sanitary Mfg. Co., 926 Ft. Wayne Ave.,
 Indianapolis
 Schaefer-Wetcher Co., 445 W. Jefferson Ave.,
 Detroit
 Silver-Chamberlain Co., Clayton, N. J.
 T. C. Smyth Mfg. Co., Union City, Ind.
 Tate Mfg. Co., Boston, Mass.
 M. J. Toohey & Co., Fall River, Mass.
 Tuscaloosa Mills, Tuscaloosa, Ala.
 Yocma Mills, Water Valley, Miss.

MOSQUITO LARVAECIDES

Baird & McGuire, Inc., Holbrook, Mass.
 See pages 14, 15.
 Cary Mfg. Co., Joliet, Ill.
 Chemical Supply Co., 2450 Canal Rd., Cleveland
 Chicago Sanitary Prods. Co.,
 2526 W. Congress St., Chicago
 Clifton Chemical Co., 247 Front St., N.Y.
 See page 19.
 Eagle Soap Corp., Huntington, Ind.
 See page 26.
 Fuld Bros, 2308 Frederick Ave., Baltimore
 See page 30.
 Hockwald Chemical Co., 30 Bluxome St.,
 San Francisco
 Hunt Mfg. Co., Lisbon Rd., Cleveland
 William E. Jordan & Bro.,
 2590 Atlantic Ave., Brooklyn
 Maywood Pest Exterminators, 1206 S. 1st Ave.,
 Maywood, Ill.
 McCormick & Co., Inc., Baltimore, Md.
 See page 72.
 Merck & Co., Rahway, N.J.
 Palmer Prods., Inc., Waukesha, Wis.
 Sherwood Petroleum Co., Bush Terminal Bldg.,
 No. 1, Brooklyn
 U. S. Sanitary Specialties Corp.,
 435 S. Western Ave., Chicago
 White Tar Co., Kearny, N. J.

MOTH PROOFING COMPOUNDS

American Cyanamid & Chemicals Corp.,
 30 Rockefeller Plaza, N.Y.
 Cary Mfg. Co., Joliet, Ill.
 E. I. du Pont de Nemours & Co.,
 Wilmington, Del.
 General Dyestuffs Corp., 230—5th Ave., N.Y.
 R. W. Greff & Co., 10 E. 40th St., N.Y.
 Maywood Pest Exterminators, 1206 S. 1st Ave.,
 Maywood, Ill.
 Merck & Co., Rahway, N.J.
 Murray & Nickell Mfg. Co.,
 2608 Arthington St., Chicago

**MOTH SPRAYS (See INSECTICIDES,
LIQUID)****MOTTLED SOAPS**

Cincinnati Soap Co., Cincinnati
 Hewitt Soap Co., Dayton, O.
 Lightfoot Schultz Co., Hoboken, N. J.
 Los Angeles Soap Co., Los Angeles
 National Soap Co., P. O. Box 1613,
 Tacoma, Wash.

Peck's Prods. Co., 522-40 N. 2nd St., St. Louis
 Geo. A. Schmidt Co., 236 W. North Ave., Chgo.
 John T. Stanley Co., 640 W. 30th St., N.Y.
 M. Werk Co., Cincinnati, O.
 Allen B. Wrisley Co., 6801 W. 65th St., Chgo.

MOUSE SEEDS (see POISONED SEEDS)**MUSKS, ARTIFICIAL (See AROMATIC
CHEMICALS)****NAPHTHA, see SOLVENT NAPHTHA****NAPHTHALENE**

American-British Chem. Supplies, Inc.,
 180 Madison Ave., N.Y. See page 9.
 Barrett Co., 40 Rector St., N.Y. See page 16.
 S. H. Bell Co., 1407 Gulf Bldg., Pittsburgh
 Dominion Tar & Chem. Co., Ltd.,
 430 Canada Cement Bldg., Montreal
 E. I. du Pont de Nemours & Co.,
 Wilmington, Del.
 Innis, Speiden & Co., 117 Liberty St., N.Y.
 See page 40.
 William E. Jordan & Bro.,
 2590 Atlantic Ave., Brooklyn
 Koppers Products Co., Koppers Bldg.,
 Pittsburgh
 Neville Co., Pittsburgh
 Reilly Tar & Chem. Corp., P. O. Box 125,
 Indianapolis See page 56.
 White Tar Co., Kearny, N. J.

**NAPHTHALENE PERFUMES (see PER-
FUMING COMPOUNDS)****NAPHTHALENE SULFONATES**

E. I. du Pont de Nemours & Co.,
 Wilmington, Del.
 General Dyestuffs Corp., 230—5th Ave., N.Y.
 National Aniline & Chem. Co., 40 Rector St.,
 N.Y.

**NEROLI OIL (Artificial) see METHYL
ANTHRANILATE)****NICOTINE COMPOUNDS**

Goulard & Olena, Inc., 140 Liberty St., N.Y.
 Hood River Spray Co., Hood River, Ore.
 Kemiko Mfg Co., 191 Murray St.,
 Newark, N. J.
 Lethelin Products Co., Manhasset, N.Y.
 Sanocide Spray Co., Fennville, Mich.
 Tobacco By-Products & Chem. Corp.,
 Columbia Bldg., Louisville, Ky.

NOVELTY SOAPS

Diamond Soap Co.,
 1 Lowden St., Elizabeth, N. J.
 Lightfoot Schultz Co., 1412 Park Ave.,
 Hoboken, N.J.
 Allen B. Wrisley Co., 6801 W. 65th St., Chicago

**ODORLESS KEROSENE (see Petroleum Base,
Deodorized)**

OIL MILL EQUIPMENT

V. D. Anderson Co., 1935 W. 96th St., Cleveland
Albert Bruecke, 30 Rockefeller Plaza, N.Y.

See page 18.

Buckeye Iron & Brass Works, Dayton, O.
Consolidated Prods. Co., 15 Park Row, N.Y.

(Used) See page 21.

French Oil Mill Mach. Co., Piqua, O.
 William Garrigue Co., 9 S. Clinton St., Chicago
Alan Porter Lee, Inc., 136 Liberty St., N.Y.

See page 41.

Robinson, Butler, Hemingway Co.,

Box 371, Bonud Brook, N. J.

Ernest Scott & Co., Fall River, Mass.

Stein-Brill Corp., 183 Varick St., N.Y.

(Used) See page 65.

Struthers-Wells Co., Warren, Pa.

Wurster & Sanger, Inc.,

5201 Kenwood Ave., Chicago

OIL HYDROGENATION PLANTS

Albert Bruecke, 30 Rockefeller Plaza, N.Y.

See page 18.

William Garrigue Co., 9 S. Clinton St., Chicago

Alan Porter Lee, Inc., 136 Liberty St., N.Y.

See page 41.

Robinson, Butler, Hemingway & Co.,

Box 371, Bound Brook, N. J.

Wurster & Sanger, Inc.,

5201 Kenwood Ave., Chicago

OIL SOAP

Antiseptol Liquid Soap Co.,

5424 N. W. Highway, Chicago

Armour Soap Wks., 1355 W. 31st St., Chicago

See page 12.

Baums Castorine Co., 200 Mathew St.,

Rome, N.Y.

Chicago Sanitary Prods. Co.,

2526 W. Congress St., Chicago

Churchill Mfg. Co., 309 Douglas St.,

Sioux City, Ia.

Clifton Chemical Co., 247 Front St., N.Y.

See page 19.

Davies Young Soap Co., Dayton, O.

See page 23.

Eagle Soap Corp., Huntington, Ind.

See page 25.

Fuld Bros., 2308 Frederick Ave., Baltimore

See page 30.

James Good, Inc., Kensington, Phila.

See page 34.

Haag Laboratories, Inc., 6101 S. May St.,

Chicago

Harley Soap Co., 2832 E. Pacific St., Phila.

Harris Soap Co., Buffalo, N.Y.

Hubman Supply Co., 225 N. 4th St.,

Columbus, O.

Hunt Mfg. Co., Lisbon Rd., Cleveland

Jansen Soap & Chemical Co.,

324 Leavenworth St., San Francisco, Cal.

Kranich Soap Co., 54 Richards St., Brooklyn

Marshall Products, Inc., 806 N. 1st St., St. Louis

Masurv-Young Co., 76 Roland St., Boston

New York Soap Corp., 294 Pearl St., N.Y.

See page 44.

North Coast Chem. & Soap Works,

Seattle, Wash.

Palmer Products, Inc., Waukesha, Wis.

Paper Makers Chemical Corp.,

Kalamazoo, Mich.

Peck's Prods. Co., 522-40 N. 2nd St., St. Louis

Procter & Gamble Co., Cincinnati

Theo. B. Robertson Prods. Co.,

700 W. Division St., Chicago

Geo. A. Schmidt Co., 236 W. North Ave.,
 Chicago

Selig Co., 336 Marietta St., Atlanta, Ga.

U. S. Sanitary Specialties Corp.,

435 S. Western Ave., Chicago

Warren Soap Mfg. Co., 51 Waverly St.,
 Cambridge, Mass.

OLEIC ACID (see RED OIL)**OLIVE OIL (Commercial)**

(see also *Brokers and Dealers*)

Irving R. Boody & Co., 99 Wall St., N.Y.

T. G. Cooper & Co., 47 N. 2nd St., Phila.

Eastern Industries, Inc., 125 Bergen St.,

Harrison, N. J.

W. R. Grace & Co., 7 Hanover Sq., N.Y.

Otto A. C. Hagen Co., Ledger Bldg., Phila.

Leghorn Trading Co., 155 E. 44th St., N.Y.

See page 42.

Francisco Martin, 80 Wall St., N.Y.

J. H. Redding Co., 17 Battery Pl., N.Y.

E. M. Sergeant Pulp & Chemical Co.,

350 Fifth Ave., N.Y.

Smith-Weihman Co., 15 Moore St., N.Y.

See page 61.

Snow & Cleaver, Inc., 15 William St., N.Y.

See page facing 3rd cover.

Wilbur-Ellis Co., 17 Battery Pl., N.Y.

See page 71.

OLIVE OIL FOOTS

(see also *Brokers and Dealers*)

T. G. Cooper & Co., 47 N. 2nd St., Phila.

Eastern Industries, Inc., 125 Bergen St.,

Harrison, N. J.

Otto A. C. Hagen Co., Ledger Bldg., Phila.

Leghorn Trading Co., 155 E. 44th St., N.Y.

See page 42.

J. H. Redding Co., 17 Battery Pl., N.Y.

E. M. Sergeant Pulp & Chemical Co.,

350 Fifth Ave., N.Y.

Smith-Weihman Co., 15 Moore St., N.Y.

See page 61.

Snow & Cleaver, Inc., 15 William St., N.Y.

See page facing 3rd cover.

Wilbur-Ellis Co., 17 Battery Pl., N.Y.

See page 71.

OLIVE OIL SOAPS

Antiseptol Co., 5524 Northwest Highway,

Chicago

Armour Soap Wks., 1355 W. 31st St., Chicago

See page 12.

Chicago Sanitary Prods. Co.,

2526 W. Congress St., Chicago

Cincinnati Soap Co., Cincinnati

Davies Young Soap Co., Dayton, Ohio

See page 23.

Eagle Soap Corp., Huntington, Ind.

See page 26.

Fuld Bros., 2308 Frederick Ave., Baltimore

See page 30.

Hewitt Soap Co., Dayton, Ohio

Hockwald Chemical Co., 30 Bluxome St.,

San Francisco

Hunt Mfg. Co., Lisbon Rd., Cleveland

H. Kohnstamm & Co., 91 Park Pl., N.Y.

Los Angeles Soap Co., Los Angeles

Peck's Prods. Co., 522-40 N. 2nd St., St. Louis

OLIVE OIL SOAPS (Cont'd)

Procter & Gamble Co., Cincinnati, O.
 Geo. A. Schmidt Co., 236 W. North Ave.,
 Chicago
 Swift & Co., Union Stock Yards, Chicago
 U. S. Sanitary Specialties Corp.,
 435 S. Western Ave., Chicago
 Warren Soap Mfg. Co., 51 Waverly St.,
 Cambridge, Mass.
 Allen B. Wrisley Co., 6801 W. 65th St., Chicago

ORANGE OIL (See ESSENTIAL OILS)**ORTHODICHLORBENZENE**

Dow Chemical Co., Midland, Mich. See page 25.
 E. I. du Pont de Nemours & Co.,
 Wilmington, Del.
 Hooker Electrochemical Co.,
 60 E. 42nd St., N.Y. See page 36.
 Monsanto Chemical Works, 1724 S. 2nd St.,
 St. Louis
 Niagara Alkali Co., 9 E. 41st St., N.Y.
 See page 46.
 Solvay Sales Corp., 40 Rector St., N.Y.
 See pages 62, 63.

OXALIC ACID*(see also Dealers)*

Amer. Cyanamid & Chem. Corp.,
 30 Rockefeller Plaza, N.Y.
 E. I. du Pont de Nemours & Co.,
 Wilmington, Del.
 Faesy & Besthoff, Inc., 22 E. 40th St., N.Y.
 Grasselli Chemical Co., 1800 Guardian Bldg.,
 Cleveland See page 35.
 Innis, Speiden & Company,
 117 Liberty St., N.Y. See page 40.
 Mallinckrodt Chemical Wks., St. Louis, Mo.
 Merck & Co., Rahway, N. J.
 E. M. Sergeant Pulp & Chemical Co.,
 350 Fifth Ave., N.Y.
 Joseph Turner & Co., 500—5th Ave., N.Y.
 See page 67.
 Victor Chemical Works,
 141 W. Jackson Blvd., Chicago

**PACKAGING MACHINERY (see CARTON-
ING MACHY., FILLING MACHY.,
WEIGHING EQUIP., WRAPPING
MACHY.)****PAILS (Fibre) (see BARRELS, FIBRE)****PAILS (Steel)**

Central Can Co., 2415 W. 19th St., Chicago
 Fein's Tin Can Co., 284 Furman St., Bklyn.
 Geuder, Paeschke & Frey Co., Milwaukee
 Pittsburgh Can Co., Pittsburgh, Pa.
 Pressed Steel Tank Co., 5717 Greenfield Ave.,
 Milwaukee, Wisc.
 John Trageser Steam Copper Works,
 Grand Ave., Maspeth, L. I., N.Y.
 Vulcan Stamping & Mfg. Co., 4036 W. Lake St.,
 Chicago
 Wheeling Corrugating Co., Wheeling, W. Va.
 Wilson & Bennett Mfg. Co.,
 6532 S. Menard Ave., Chicago

PAILS (Wooden)

Beaver Mills, Keene, N. H.
 Eagle Woodenware Mfg. Co., Hamilton, O.
 Gambirinus Cooperage Works, 930 Mason St.,
 Louisville, Ky.
 Impervious Package Co., Keene, N. H.
 Menasha Woodenware Co., Menasha, Wis.
 Richmond Cedar Works, Richmond, Va.

PALM KERNEL OIL*(see also Brokers and Dealers)*

Balfour, Gurthrie & Co., 67 Wall St., N.Y.
 Irving R. Boody & Co., 99 Wall St., N.Y.
 Durkee Famous Foods, Inc., 2670 Elston Ave.,
 Chicago
 Otto A. C. Hagen Co., 929 Ledger Bldg.,
 Phila.
 Spencer Kellogg & Sons, Buffalo, N.Y.
 J. H. Redding Co., 17 Battery Pl., N.Y.
 C. F. Simonin's Sons, Tioga & Beigrade Sts.,
 Philadelphia
 Smith-Weihman Co., 15 Moore St., N.Y.
 See page 61.
 Snow & Cleaver, Inc., 15 William St., N.Y.
 See page facing 3rd cover.
 Wilbur-Ellis Co., 17 Battery Pl., N.Y.
 See page 71.

PALM OIL*(see also Brokers and Dealers)*

Balfour, Gurthrie & Co., 67 Wall St., N.Y.
 Irving R. Boody & Co., 99 Wall St., N.Y.
 T. G. Cooper & Co., 47 N. 2nd St., Phila.
 Durkee Famous Foods, Inc., 2670 Elston Ave.,
 Chicago
 Otto A. C. Hagen Co., 929 Ledger Bldg.,
 Phila.
 Leghorn Trading Co., 155 E. 44th St., N.Y.
 See page 42.
 J. H. Redding Co., 17 Battery Pl., N.Y.
 Smith-Weihman Co., 15 Moore St., N.Y.
 See page 71.
 Snow & Cleaver, Inc., 15 William St., N.Y.
 See page facing 3rd cover.
 Stein, Hall & Co., 285 Madison Ave.,
 N.Y. (Sumatra)
 Wilbur-Ellis Co., 17 Battery Pl., N.Y.
 See page 71.

PAPER CANS (see CANS)**PAPER (Corrugated)**

Consolidated Paper Co., Monroe, Mich.
 Container Corp. of America,
 111 W. Washington St., Chicago
 Robert Gair Co., 155 E. 44th St., N.Y.
 Hinde & Dauch Paper Co., Sandusky, O.
 F. J. Kress Box Co., 29-30 Liberty Ave.,
 Pittsburgh

PAPER CUPS

F. N. Burt Co., Batavia, N.Y.
 Individual Drinking Cup Co., Easton, Pa.
 Vortex Mfg. Co., 430 N. Western Ave., Chicago

PAPER (Fancy Wrapping)

Aluminum Co. of America, Gulf Bldg.,
Pittsburgh
Beekman Paper & Card Co.,
137 Varick St., N.Y.
A. M. Collins Mfg. Co., 1518 Walnut St., Phila.
Louis Dejonge & Co., 155—6th Ave., N.Y.
DuPont Cellophane Co., 350—5th Ave., N.Y.
C. J. Fox Co., 236 Abbron St., Providence, R. I.
Fox Paper Co., Lockland, Cincinnati, O.
Hampden Glazed Paper & Card Co.,
Holyoke, Mass.
Henderson Lithographing Co., Cincinnati
Keller-Dorain Paper Co., 390—4th Ave., N.Y.
New England Card & Paper Co.,
10 Hanover St., Springfield, Mass.
Pictorial Package Co., Aurora, Ill.
Marquette Lithograph Co.,
730 N. Franklin St., Chicago
Nashua Gummed & Coated Paper Co.,
Nashua, N. H.
Potomac Lithograph Mfg. Co.,
Washington, D. C.
Richardson Co., Lockland, O.
Geo. Schmitt & Co., Grand & Florence Sts.,
Brooklyn
Louis Schulman Co., 465 Broome St., N.Y.
Sylvania Industrial Corp., 122 E. 42nd St., N.Y.
Tamm & Co., 66 Duane St., N.Y.
Transcello Paper Co., Milwaukee, Wis.
U. S. Printing & Lithographing Co.,
Cincinnati, O.
Walther & Co., Inc., 114 Harrison St., Bklyn.
Whiting-Paterson Co., Inc., 320—13th St.,
Philadelphia
Chas. W. Williams & Co., Inc.,
309 Lafayette St., N.Y.

PAPER TOWELS

Brown Co., Portland, Me.
Hoberg Paper & Fibre Co., Green Bay, Wis.
Scott Paper Co., Chester, Pa.
Straubel Paper Co., Green Bay, Wis.
U. S. Envelope Co., Lititz, Pa.

PARA BLOCKS (see DEODORIZING BLOCKS)**PARADICHLORBENZENE**

Dow Chemical Co., Midland, Mich. See page 25.
E. I. Du Pont de Nemours & Co.,
Wilmington, Del.
General Chemical Co., 40 Rector St., N.Y.
See page 31.
Hooker Electrochemical Co.,
60 E. 42nd St., N.Y. See page 36.
Monsanto Chemical Works, 1724 S. 2nd St.,
St. Louis
Niagara Alkali Co., 9 E. 41st St., N.Y.
See page 46.
Solvay Sales Corp., 40 Rector St., N.Y.
See pages 62, 63.

PARAFFIN

Borne-Scrymser Co., 17 Battery Pl., N.Y.
E. A. Bromund Co., 258 Broadway, N.Y.
A. C. Drury & Co., 219 East North Water St.,
Chicago
Gulf Refining Co., Frick Annex, Pittsburgh

Innis, Speiden & Co., 117 Liberty St., N.Y.

See page 40.

Sherwood Petroleum Co., Bush Terminal
Bldg. No. 1, Bklyn.
Sinclair Refining Co., 630—5th Ave., N.Y.
Smith & Nichols, 121 Maiden Lane, N.Y.
Standard Oil Co., (N.J.) 26 Broadway, N.Y.
Strohmeyer & Arpe Co.,
139 Franklin St., N.Y.
Texas Co., 135 E. 42nd St., N.Y.

PARAFFIN OILS

Deep Rock Oil Corp., 155 N. Clark St., Chicago
A. C. Drury & Co., 219 East North Water St.,
Chicago
Gulf Refining Co., Pittsburgh
S. Schwabacher & Co., 25 Beaver St., N.Y.
Sherwood Petroleum Co., Bush Terminal Bldg.
No. 1, Brooklyn, N.Y.
Sinclair Refining Co., 630—5th Ave., N.Y.
Shell Petroleum Corp., Shell Bldg., St. Louis
Skelly Oil Co., 2534 Madison Ave.,
Kansas City, Mo.
L. Sonneborn Sons, Inc., 88 Lexington Ave.,
N.Y. See page 64.

PARAFORMALDEHYDE

E. I. Du Pont de Nemours & Co.,
Wilmington, Del.
Heyden Chemical Co., 50 Union Sq., N.Y.
Mallinckrodt Chem. Wks.,
2nd & Mallinckrodt Sts., St. Louis, Mo.
Merck & Co., Rahway, N. J.
Sherka Chemical Co., 85 Orange St.,
Bloomfield, N. J.

PARIS GREEN

Ansbacher-Siegle Corp., Rosebank, S. I.
Chipman Chemical Engineering Co.,
Bound Brook, N. J.
Dow Chemical Co., Midland, Mich. See page 25.
Fred L. Lavanburg Co., 90 John St., N.Y.
Sherwin-Williams Co., Cleveland

PASTES (see ADHESIVES)**PATCHOULI OIL (see ESSENTIAL OILS)****PEACH KERNEL OIL (see ESSENTIAL****PEANUT OIL**

(see also Brokers and Dealers)

Balfour, Guthrie & Co., 67 Wall St., N.Y.
Irving R. Boody Co., 132 Front St., N.Y.
Durkee Famous Foods, Inc., 2670 Elston Ave.,
Chicago
Otto A. C. Hagen Co., 929 Ledger Bldg.,
Phila.
Spencer Kellogg & Sons, Buffalo, N.Y.
Mitsui & Co., 350—5th Ave., N.Y.
J. H. Redding Co., 17 Battery Pl., N.Y.
Snow & Cleaver, Inc., 15 William St., N.Y.
See page facing 3rd cover.
Southern Cotton Oil Co.,
Produce Exchange, N.Y.
Wilbur-Ellis Co., 17 Battery Pl., N.Y.
See page 71.

PEARL ASH (see POTASSIUM CARBONATE)**PENNYROYAL OIL (see ESSENTIAL OILS)****PEPPERMINT OIL (see ESSENTIAL OILS)****PERCOLATORS (for Pyrethrum)**

Brighton Copper Works, 2163 Western Ave., Cincinnati

Arthur Colton Co., Detroit, Mich.

Consolidated Prods. Co., 15 Park Row, N.Y.

(Used)

See page 21.

Farlinger Rice Co., 56 N. 19th St.,

East Orange, N. J.

Newman Tallow & Soap Machy. Co.,

1051 W. 35th St., Chicago (Used)

See page 45.

Pfandler Co., 89 East Ave., Rochester, N.Y.

Ernest Scott & Co., Fall River, Mass.

Stein-Brill Corp., 183 Varick St., N.Y.

(New & Used)

See page 65.

F. J. Stokes Machine Co., Philadelphia

PERFUMING COMPOUNDS

van Ameringen-Haebler, Inc.,

315—4th Ave., N.Y. See pages 10, 11.

Aromatic Products, Inc., 15 E. 30th St., N.Y.

See page 13.

Ph. Chaleyer, Inc., 200 Varick St., N.Y.

Antoine Chiris Co., 147 Waverly Pl., N.Y.

Compagnie Parento, Croton, N.Y.

Dodge & Olcott Co., 180 Varick St., N.Y.

P. R. Dreyer Inc., 12 E. 12th St., N.Y.

A. C. Drury & Co., 219 East North Water St., Chicago

E. I. Du Pont de Nemours & Co., Inc.,

Wilmington, Del.

See page facing page 1.

Evergreen Chemical Co., 160—5th Ave., N.Y.

Felton Chemical Co., 603 Johnson Ave.,

Brooklyn

See page 30.

Chas. Fischbeck Co., 119 W. 19th St., N.Y.

Fritzsche Brothers, Inc., 76 Ninth Ave., N.Y.

Givaudan-Delawanna, Inc., 40—5th Ave., N.Y.

See inside front cover, 33.

Heine & Co., 54 Cliff St., N.Y.

Hymes Bros. Co., 37 Howard St., N.Y.

Industrial Organics, 151 W. 25th St., N.Y.

Lanvoix Chem. Co., 549 W. Randolph St., Chgo.

Geo. Lueders & Co., 427 Washington St., N.Y.

Magnus, Mabec & Reynard, 32 Cliff St., N.Y.

A. Maschmeijer, Jr., Inc., 43 W. 16th St., N.Y.

Neuman-Buslee & Wolfe, 224 W. Huron St., Chicago

Orbis Products Corp., 215 Pearl St., N.Y.

See page 4.

Pfaltz & Bauer, 300 Pearl St., N.Y.

Polak's Frutal Wks., Inc., 350 W. 31st St., N.Y.

Riviera Products Co., 215 W. Ohio St.,

Chicago, Ill.

H. C. Ryland, Inc., 161 Water St., N.Y.

Schimmel & Co., 601 W. 26th St., N.Y.

Edwin Seebach Co., 912 Broadway, N.Y.

C. A. Seguin Co., 500 N. Dearborn St., Chicago

Wm. G. Sibbach & Co., 201 S. 2nd Ave., Maywood, Ill.

Geo. Silver Import Co., 365—4th Ave., N.Y.

Ungerer & Co., 13 W. 20th St., N.Y.

See page facing front cover, 68.

Van Dyk & Co., 57 Wilkinson Ave., Jersey City, N. J.

Albert Verley, Inc., 11 E. Austin Ave., Chicago
See page 69.

PERFUME DISSEMINATORS

Ellis Davidson Co., 40 W. 22nd St., N.Y.

Florence Art Co., 54 W. 3rd St., N.Y.

Robinson Clay Prod. Co., Empire State Bldg., N.Y. (On special order.)

PETIT GRAIN OIL (see ESSENTIAL OILS)**PETROLATUM (Petroleum Jelly)**

Borne-Scrymser & Co., 17 Battery Pl., N.Y.

Chesebrough Mfg. Co., 17 State St., N.Y.

Malone Oil Co., 2199 E. 18th St., Cleveland

Pennsylvania Refining Co., Karns City, Pa.

S. Schwabacher & Co., 25 Beaver St., N.Y.

(Liquid)

Shell Petroleum Corp., Shell Bldg., St. Louis

Sherwood Petroleum Co., Bush Terminal Bldg.,

No. 1, Brooklyn, N.Y.

Sinclair Refining Co., 630—5th Ave., N.Y.

L. Sonneborn Sons, 88 Lexington Ave., N.Y.

See page 64.

Standard Oil Co., (N.J.), 26 Broadway, N.Y.

PETROLEUM BASE, Deodorized

Atlantic Refining Co., 260 S. Broad St., Phila.

O'Connor & Kremp, 11 W. 42nd St., N.Y.

Sherwood Petroleum Co., Bush Terminal Bldg.,

No. 1, Brooklyn, N.Y.

L. Sonneborn Sons, 88 Lexington Ave., N.Y.

See page 64.

Standard Oil Co. of Ind., 910 S. Michigan Ave., Chicago

PETROLEUM BASES (For Agricultural Sprays, Horticultural Sprays, Cattle Sprays, Insecticides, Polishes, etc.)

American Mineral Spirits Co., 330 S. Mich., Chicago

Anderson-Prichard Oil Corp., Oklahoma City, Oklahoma

Atlantic Refining Co., 260 S. Broad St., Phila.

Beacon Oil Co., Everett, Mass.

Deep Rock Oil Corp., 155 N. Clark St., Chicago

Empire Oil Co., Oil City, Pa.

Gulf Refining Co., Frick Annex, Pittsburgh

Indian Refining Co., Lawrenceville, Ind.

O'Connor & Kremp, 11 W. 42nd St., N.Y.

Oil Service Co., Warren, Pa.

Pennsylvania Ref. Co., Karns City, Pa.

Pennzoil Co., Oil City, Pa.

Refiners Petroleum Co., 122 S. Mich. Blvd., Chicago

Shell Petroleum Corp., Shell Bldg., St. Louis

Sherwood Petroleum Co., Bush Terminal Bldg.,

No. 1, Brooklyn

Sinclair Refining Co., 630—5th Ave., N.Y.

Skelly Oil Co., 2534 Madison Ave.,

Kansas City, Mo.

L. Sonneborn Sons, 88 Lexington Ave., N.Y.

See page 64.

Standard Oil Co., (Ind.) 910 S. Michigan Ave., Chicago

Standard Oil Co., (N.J.) 26 Broadway, N.Y.

Sun Oil Co., 1608 Walnut St., Philadelphia

Texas Co., 135 E. 42nd St., N.Y.

Tidewater Oil Co., 11 Broadway, N.Y.

PETROLEUM ETHER (see ETHER)

PHENOL (Carbolic Acid)

Barrett Company, 40 Rector St., N.Y.

See page 16.

Dow Chemical Co., Midland, Mich. See page 25.

Heyden Chemical Corp., 50 Union Sq., N.Y.

Innis Speiden & Co., 117 Liberty St., N.Y.

See page 40.

William E. Jordan & Bro.,

2590 Atlantic Ave., Bklyn.

Koppers Prods. Co., Koppers Bldg., Pittsburgh

Merck & Co., Rahway, N. J.

Monsanto Chemical Works, 1724 S. 2nd St.,

St. Louis, Mo.

Reilly Tar & Chem. Corp., P. O. Box 125,

Indianapolis

See page 56.

PHENOL-COEFFICIENT DETERMINATIONS (see CONSULTANTS)**PHENYL ACETIC ALDEHYDE (see AROMATIC CHEMICALS)****PHENYL ETHYL ALCOHOL (see AROMATIC CHEMICALS)****PHOSPHOROUS PASTE**

John Opitz, Inc., 50-14—39th St.,

Long Island City, N.Y.

Sennewald Drug Co., 8th & Hickory Sts.,

St. Louis

PINE OIL

American Turp. & Tar Co.,

810 S. Broad St., New Orleans

Continental Turp. & Rosin Corp., Laurel, Miss.

Dixie Pine Prods. Co., Hattiesburg, Miss.

General Naval Stores Co., 230 Park Ave., N.Y.

Gulf Naval Stores Supply Co.,

Whitney Bldg., New Orleans

Hercules Powder Co., Wilmington, Del.

National Turp. Prods. Co., Gulf Point, Fla.

Phoenix Naval Stores Co., Gulfport, Miss.

Taylor, Lowenstein & Co., Mobile, Ala.

PINE OIL DISINFECTANTS (see DISINFECTANTS, PINE OIL)**PINE NEEDLE OIL (see ESSENTIAL OILS)****PINE SCRUB SOAPS (see SCRUBBING SOAPS)****PIPE COILS**

Alloy Prods. Corp., 221 Madison St.,

Waukesha, Wisc.

Brighton Copper Works,

2163 Western Ave., Cinn.

Harrisburg Steel Corp., Harrisburg, Pa.

Hartford Tube Products Co., Hartford, Conn.

Houchin Machy. Co., Hawthorne, N. J.

See page 37.

Huber Machine Co., 259—46th St., Brooklyn

See page 38.

National Pipe Bending Co., New Haven, Conn.

Philadelphia Pipe Bending Co., 4100 N. 5th St., Philadelphia

Pittsburgh Pipe Coil & Bending Co.,

61 Bridge St., Etna, Pa.

Rempe Co., 340 N. Sacramento Blvd., Chicago

Whitlock Coil Pipe Co., Hartford, Conn.

PLANT SPRAY BASE (See PETROLEUM PRODUCTS)**PLASTIC PRODUCTS**

Bakelite Corp., Bound Brook, N.J.

General Electric Co., West Lynn, Mass.

General Plastics, Inc., North Tonawanda, N.Y.

Goodyear Tire & Rubber Co., Akron, O.

Resinox Corp., Terre Haute, Ind.

Toledo Synthetic Prods., Toledo, O.

PLATES, STEEL, CORROSION-RESISTANT (see STEEL, CORROSION-RESISTANT)**PLODDERS**

Consolidated Prods. Co., 15 Park Row, N.Y.

(Used)

See page 21.

Houchin Machinery Co., Hawthorne, N. J.

See page 37.

Huber Machine Co., 265—46th St., Brooklyn

See page 38.

J. M. Lehmann Co., 218 W. Broadway, N.Y.

Newman Tallow & Soap Machy. Co.,

1051 W. 35th St., Chicago (Used)

See page 45.

Stein-Brill Corp., 183 Varick St., N.Y.

(Used)

See page 65.

POISONED SEEDS

Sennewald Drug Co., Hickory & 8th St.,

St. Louis

Solicide Laboratories, Montclair, N.J.

W. R. Sweeney, Salisbury, Mo.

POLISH BASES (See PETROLEUM BASES)**POLISH, AUTO**

Armiger Chem. Co., 2155 W. Austin Ave.,

Chicago

Baums Castorine Co., 200 Mathew St.,

Rome, N.Y.

Cary Mfg. Co., Joliet, Ill.

Champion Mfg. Co., 322 S. Erie St.,

Indianapolis, Ind.

Chemical Supply Co., 2450 Canal Rd., Cleveland

Chicago Sanitary Prods. Co.,

2526 W. Congress St., Chicago

Eagle Soap Corp., Huntington, Ind.

See page 26.

Fuld Bros., 2308 Frederick Ave., Baltimore

See page 30.

James Good, Inc., Kensington, Phila.

See page 34.

Harley Soap Co., 2832 E. Pacific St., Phila.

Hubman Supply Co., 225 N. 4th St.,

Columbus, O.

Hull Co., 305 Washington St., Brooklyn

Industrial Labs., 17-19 W. Conway St.,

Baltimore

International Metal Polish Co.,

Twil St. & Belt. R.R., Indianapolis

POLISH, AUTO (Cont'd)

Marshall Prods., Inc., 806 N. 1st St., St. Louis
 National Oil Prods. Co., Harrison, N.J.
 Palmer Products, Inc., Waukesha, Wis.
 Peck's Prods. Co., 522-40 N. 2nd St., St. Louis
 Theo. B. Robertson Prods. Co.,
 700 W. Division St., Chicago
 Shores Co., Cedar Rapids, Ia.
 Solshine Mfg. Co., 44 Brookline St., Cambridge,
 Mass.
 H. F. Staples Co., Medford, Mass.
 U. S. Sanitary Specialties Corp.,
 435 S. Western Ave., Chicago
 John T. Stanley Co., 640 W. 30th St., N.Y.

POLISH, FLOOR

Algoma Mfg. Co., Green Bay, Wis.
 Antiseptol Co., 5524 Northwest Highway,
 Chicago
 Armiger Chem. Co., 2155 W. Austin Ave.,
 Chicago
 Baums Castorine Co., 200 Mathew St.,
 Rome, N.Y.
 Cary Mfg. Co., Joliet, Ill.
 Chemical Supply Co., 2450 Canal Rd., Cleveland
 Chicago Sanitary Prods. Co.,
 2526 W. Congress St., Chicago
 Churchill Mfg. Co., 309 Douglas St.,
 Sioux City, Ia.
 Clifton Chemical Co., 247 Front St., N.Y.
 See page 19.
 Davies Young Soap Co., Dayton, O.
 See page 23.
 Eagle Soap Corp., Huntington, Ind.
 See page 26.
 Federal Varnish Co., 333 S. Peoria St.,
 Chicago
 See page 28.
 Franklin Research Co., 5134 Lancaster Ave.,
 Phila.
 Fuld Bros., 2308 Frederick Ave., Baltimore
 See page 30.
 Globe Sanitary Supply Co., 2249 E. 38th St.,
 Los Angeles
 James Good, Inc., Kensington, Phila.
 See page 34.
 Harley Soap Co., 2832 E. Pacific St., Phila.
 Hockwald Chemical Co., 30 Bluxome St.,
 San Francisco
 Hubman Supply Co., 225 N. 4th St.,
 Columbus, O.
 Hull Co., 305 Washington St., Brooklyn
 Hunt Mfg. Co., Lisbon Rd., Cleveland
 International Metal Polish Co., Indianapolis
 Masury-Young Co., 76 Roland St., Boston
 Pacific Chem. Co., 1241 N. Main St.,
 Los Angeles
 Palmer Products, Inc., Waukesha, Wis.
 Peck's Prods. Co., 522-40 N. 2nd St., St. Louis
 Pioneer Mfg. Co., 3053 E. 87th St., Cleveland
 Theo. B. Robertson Prods. Co.,
 700 W. Division St., Chicago
 Selig Co., 336 Marietta St., Atlanta, Ga.
 Solshine Mfg. Co., 44 Brookline St., Cambridge,
 Mass.
 H. F. Staples Co., Medford, Mass.
 Uncle Sam Chem. Co., 329 E. 29th St., N.Y.
 U. S. Sanitary Specialties Corp.,
 435 S. Western Ave., Chicago
 T. F. Washburn Co., 2244 Elston Ave., Chicago
 Windsor Wax Co., 53 Park Pl., N.Y.

POLISH, FURNITURE

Algoma Mfg Co., Green Bay, Wis.

Antiseptol Co., 5524 Northwest Highway,
 Chicago
 Armiger Chem. Co., 2155 W. Austin Ave.,
 Chicago
 Baums Castorine Co., 200 Mathew St.,
 Rome, N.Y.
 Cary Mfg. Co., Joliet, Ill.
 Chemical Supply Co., 2450 Canal Rd., Cleveland
 Chicago Sanitary Prods. Co.,
 2526 W. Congress St., Chicago
 Clifton Chemical Co., 247 Front St., N.Y.
 See page 19.
 Crystal Labs., 21 W. Park Way, N.S.,
 Pittsburgh
 Davies-Young Soap Co., Dayton, O.
 See page 23.
 Eagle Soap Corp., Huntington, Ind.
 See page 26.
 Franklin Research Co., 5134 Lancaster Ave.,
 Phila.
 Fuld Bros., 2308 Frederick Ave., Baltimore
 See page 30.
 Globe Sanitary Supply Co., 2249 E. 38th St.,
 Los Angeles
 James Good, Inc., Kensington, Phila.
 See page 34.
 Haag Laboratories, 6101 S. May St., Chicago
 Harley Soap Co., 2832 E. Pacific St., Phila.
 Hockwald Chemical Co., 30 Bluxome St.,
 San Francisco
 Hubman Supply Co., 225 N. 4th St.,
 Columbus, O.
 Hunt Mfg. Co., Lisbon Rd., Cleveland
 International Metal Polish Co.,
 Twill St. & Belt R.R., Indianapolis
 Keniko Mfg. Co., 191 Murray St.,
 Newark, N. J.
 National Oil Products Co., Harrison, N. J.
 North Coast Soap & Chem. Wks.,
 Seattle, Wash.
 Palmer Products, Inc., Waukesha, Wis.
 Perrow Chem. Co., Hurt, Va.
 Pioneer Mfg. Co., 3053 E. 87th St., Cleveland
 Theo. B. Robertson Prods. Co.,
 700 W. Division St., Chicago
 Sanitary Mfg. Co., 926 Ft. Wayne Ave.,
 Indianapolis
 Shores Co., Cedar Rapids, Ia.
 Solshine Mfg. Co., 44 Brookline St., Cambridge,
 Mass.
 H. F. Staples Co., Medford, Mass.
 Uncle Sam Chem. Co., 329 E. 29th St., N.Y.
 U. S. Sanitary Specialties Corp.,
 435 S. Western Ave., Chicago
 Windsor Wax Co., 53 Park Pl., N.Y.

POLISH, METAL

Antiseptol Co., 5524 Northwest Highway,
 Chicago
 Armiger Chem. Co., Inc., 2155 W. Austin Ave.,
 Chicago, Ill.
 Baums Castorine Co., 200 Mathew St.,
 Rome, N.Y.
 W. D. Carpenter Co., Syracuse, N.Y.
 Cary Mfg. Co., Joliet, Ill.
 Chemical Supply Co., 2450 Canal Rd., Cleveland
 Chicago Sanitary Prods. Co.,
 2526 W. Congress St., Chicago
 Davies-Young Soap Co., Dayton, O.
 See page 23.
 Fuld Bros., 2308 Frederick Ave., Baltimore
 See page 30.
 Globe Sanitary Supply Co., 2249 E. 38th St.,
 Los Angeles

POLISH, METAL (Cont'd)

James Good, Inc., Kensington, Phila.

See page 34.

Goulard & Olena, Inc., 140 Liberty St., N.Y.

Haag Laboratories, Inc., 6101 S. May St.,
Chicago

Harley Soap Co., 2832 E. Pacific St., Phila.

Hockwald Chemical Co., 30 Bluxome St.,
San FranciscoHubman Supply Co., 225 N. 4th St.,
Columbus, O.

Hull Co., 305 Washington St., Brooklyn

Hunt Mfg. Co., Lisbon Rd., Cleveland

International Metal Polish Co.,

Twill St. & Belt R.R., Indianapolis

New York Soap Corp., 294 Pearl St., N.Y.

See page 44.

Palmer Products, Inc., Waukesha, Wis.

Peck's Prods. Co., 5224 N. 2nd St., St. Louis

Pioneer Mfg. Co., 3053 E. 87th St., Cleveland

Theo. B. Robertson Prods. Co.,

700 W. Division St., Chicago

Shores Co., Cedar Rapids, Ia.

Solshine Mfg. Co., 44 Brookline St., Cambridge,
Mass.John Sunshine Chem. Co., 604 W. Lake St.,
ChicagoTrojan Prods. & Mfg. Co., 3101 S. Wabash Ave.,
Chicago

Uncle Sam Chem. Co., 329 E. 29th St., N.Y.

U. S. Sanitary Specialties Corp.,

435 S. Western Ave., Chicago

H. F. Staples Co., Medford, Mass.

Uncle Sam Chem. Co., 329 E. 29th St., N.Y.

U. S. Sanitary Specialties Corp.,

435 S. Western Ave., Chicago

Windsor Wax Co., Inc., 53 Park Pl., N.Y.

POTASH (Caustic) (see CAUSTIC POTASH)**POTASSIUM CARBONATE**

American Cyanamid & Chemicals Corp.,

30 Rockefeller Plaza, N.Y.

T. G. Cooper & Co., 47 N. 2nd St., Phila.

E. I. Du Pont de Nemours & Co.,

Wilmington, Del.

Faesy & Besthoff, 22 E. 40th St., N.Y.

Grasselli Chem. Co., 1300 Guardian Bldg.,
Cleveland

See page 35.

Industrial Chem. Sales Co., 230 Park Ave., N.Y.

Innis, Speiden & Co., 117 Liberty St., N.Y.

See page 40.

Jungmann & Co., 157 Chambers St., N.Y.

See page inside back cover.

Harshaw Chem. Co., Cleveland

Niagara Alkali Co., 9 E. 41st St., N.Y.

See page 46.

E. M. Sergeant Pulp & Chemical Co.,

350—5th Ave., N.Y.

Jos. Turner & Co., 500—5th Ave., N.Y.

See page 67.

POLISH, WAXAntiseptol Co., 5524 Northwest Highway,
ChicagoBaums Castorine Co., 200 Mathew St.,
Rome, N.Y.

Cary Mfg. Co., Joliet, Ill.

Chicago Sanitary Prods. Co.,

2526 W. Congress St., Chicago

Clifton Chemical Co., 247 Front St., N.Y.

See page 19.

Davies-Young Soap Co., Dayton, O.

See page 23.

Eagle Soap Corp., Huntington, Ind.

See page 26.

Federal Varnish Co., 333 S. Peoria St., Chicago

See page 28.

Franklin Research Co., 5134 Lancaster Ave.,
Phila.

Fuld Bros., 2308 Frederick Ave., Baltimore

See page 30.

Globe Sanitary Supply Co., 2249 E. 38th St.,
Los Angeles

James Good, Inc., Kensington, Phila.

See page 34.

Haag Laboratories, Inc., 6101 S. May St.,
ChicagoHockwald Chemical Co., 30 Bluxome St.,
San FranciscoHubman Supply Co., 225 N. 4th St.,
Columbus, O.

Hull Co., 305 Washington St., Brooklyn

Hunt Mfg. Co., Lisbon Rd., Cleveland

International Metal Polish Co.,

Twill St. & Belt R.R., Indianapolis

Palmer Products, Inc., Waukesha, Wis.

Peck's Prods. Co., 5224 N. 2nd St., St. Louis

Perrow Chem. Co., Hurt, Va.

Pioneer Mfg. Co., 3053 E. 87th St., Cleveland

Theo. B. Robertson Prods. Co.,

700 W. Division St., Chicago

POTASSIUM PERSULFATE

American Cyanamid & Chemicals Corp.,

30 Rockefeller Plaza, N.Y.

Buffalo Elec. Chem. Co.,

River Rd. & Sawyer Ave., Buffalo

E. I. du Pont de Nemours & Co.,

Wilmington, Del.

Jungmann & Co., 157 Chambers St., N.Y.

See inside back cover.

Pfaltz & Bauer, 300 Pearl St., N.Y.

Jos. Turner & Co., 500—5th Ave., N.Y.

See page 67.

POTASSIUM SILICATE

Grasselli Chemical Co., Guardian Bldg.,

Cleveland

See page 35.

Philadelphia Quartz Co., 123 S. 3rd St., Phila.

POWDER GUNS (see BELLOWS)**POWDERED SOAP (see SOAP, POWDERED)**

Do not confuse with SOAP POWDERS

PRESSES (Automatic Soap)

Consolidated Prods. Co., 15 Park Row, N.Y.

(Used)

See page 21.

Houchin Machinery Co., Hawthorne, N. J.

See page 37.

R. A. Jones & Co., Cincinnati, O.

Newman Tallow & Soap Machy. Co.,

1051 W. 35th St., Chicago (Used)

See page 45.

Stein-Brill Corp., 183 Varick St., N.Y.

(Used)

See page 65.

PRESSES (Foot and Hand Lever) (for Soap and Para Cakes)

- Consolidated Prods. Co.**, 15 Park Row, N.Y.
(Used) See page 21.
Houchin Machinery Co., Hawthorne, N. J.
See page 37.
Huber Machine Co., 259 46th St., Brooklyn
See page 38.
Newman Tallow & Soap Machy. Co.,
1051 W. 35th St., Chicago (Used) See page 45.
Stein-Brill Corp., 183 Varick St., N.Y.
(New & Used) See page 65.
F. J. Stokes Mach. Co., Philadelphia, Pa.

PRIVATE FORMULAS (see under individual products)**PROPYLENE DICHLORIDE (see SOLUTIONS, ORGANIC)****PUMICE STONE**

- Allied Industrial Prods. Co.**,
17 N. Elizabeth St., Chicago
Chas. B. Chrystal Co., 11 Park Pl., N.Y.
Goris & Arnstein, 3700 Racine Ave., Chicago
K. F. Griffiths & Co., 110 E. 42nd St., N.Y.
Hammill & Gillespie, 225 Broadway, N.Y.
National Pumice Stone Co., foot of Halsey St.,
Astoria, L. I.
Jas. H. Rhodes & Co., 157 W. Austin Ave.,
Chicago
Tamms Silica Co., 228 N. La Salle St., Chicago
Whittaker, Clark & Daniels, 245 Front St., N.Y.

PUMP GUNS (for Insecticides) (see SPRAYERS, see BELLOWS)**PUMPS**

- Aldrich Pump Co.**, 1 Pine St., Allentown, Pa.
Alsop Engineering Corp., 39 W. 60th St., N.Y.
See pages 6, 7.
American Steam Pump Co.,
Battle Creek, Mich.
Beach-Russ Co., 50 Church St., N.Y.
Blackmer Rotary Pump Co.,
Grand Rapids, Mich.
Buffalo Forge Co., 490 Broadway, Buffalo, N.Y.
Consolidated Prods. Co., 15 Park Row, N.Y.
(Used) See page 21.
M. T. Davidson Co., 154 Nassau St., N.Y.
Foster Pump Works, 54 Washington St.,
Brooklyn, N.Y.
Goulds Pumps, Inc., Seneca Falls, N.Y.
Houchin Machinery Co., Hawthorne, N. J.
See page 37.
Huber Machine Co., 259—46th St., Brooklyn
See page 38.
Ingersoll-Rand Co., 11 Broadway, N.Y.
Karl Kiefer Machine Co., Cincinnati
Lobe Pump & Machine Co., 129 Dearborn St.,
Buffalo, N.Y.
P. H. & F. M. Roots Co., Connerville, Ind.
T. Shriver & Co., Harrison, N.J.
Stein-Brill Corp., 183 Varick St., N.Y.
(Used) See page 65.
F. J. Stokes Machine Co., Philadelphia, Pa.
Taber Pump Co., 278 Elm St., Buffalo, N.Y.

Worthington Pump & Machinery Co.,
2 Park Ave., N.Y.

PYRETHRUM

- An-Fo Mfg. Co.**, 3129 Elmwood Ave.,
Oakland, Cal.
Derris, Inc., 79 Wall St., N.Y. See page 24.
J. L. Hopkins & Co., 220 Broadway, N.Y.
McCormick & Co., Baltimore, Md. See page 72.
McLaughlin, Gormley King Co., 1715—5th St.,
S. E., Minneapolis, Minn.
Murray & Nickell Mfg. Co.,
2608 Arthington St., Chicago
S. B. Penick & Co., 132 Nassau St., N.Y.
See page 47.
John Powell & Co., 114 E. 32nd St., N.Y.
See pages 51, 52.
R. J. Prentiss & Co., 100 Gold St., N.Y.
See page 53.
Sherwood Petroleum Co., Bush Terminal Bldg.,
No. 1, Brooklyn.
Allaire Woodward & Co., Peoria, Ill.

PYRETHRUM EXTRACT

- An-Fo Mfg. Co.**, 3129 Elmwood Ave.,
Oakland, Cal.
Baird & McGuire, Inc., Holbrook, Mass.
See pages 14, 15.
Cino Chem. Prods. Co., 210 Main St., Cincinnati
J. L. Hopkins & Co., 220 Broadway, N.Y.
McCormick & Co., Baltimore See page 72.
McLaughlin Gormley King Co.,
1715—5th St., S. E., Minneapolis
Murray & Nickell Mfg. Co.,
2608 Arthington St., Chicago
S. B. Penick & Co., 132 Nassau St., N.Y.
See page 47.
John Powell & Co., 114 E. 32nd St., N.Y.
See pages 51, 52.
R. J. Prentiss & Co., 100 Gold St., N.Y.
See page 53.
Seacoast Labs., Inc., 156 Perry St., N.Y.
Sherwood Petroleum Corp., Bush Terminal
Bldg. No. 1, Brooklyn
Allaire Woodward & Co., Peoria, Ill.

RAPESEED OIL

- Balfour, Guthrie & Co.**, 67 Wall St., N.Y.
Irving R. Boody & Co., 99 Wall St., N.Y.
T. G. Cooper & Co., 47 N. 2nd St., Phila.
Leghorn Trading Co., 155 E. 44th St., N.Y.
See page 42.
Smith-Weihman Co., 15 Moore St., N.Y.
See page 59.
Snow & Cleaver, Inc., 15 William St., N.Y.
See page facing 3rd cover.

RAT EXTERMINATING PRODUCTS

- Chemical Supply Co.**, 2450 Canal Rd., Cleveland
Chicago Sanitary Prods. Co.,
2526 W. Congress St., Chicago
Eagle Soap Corp., Huntington, Ind.
See page 26.
Fuld Bros., 2308 Frederick Ave., Baltimore
See page 30.
Goulard & Olena, Inc., 140 Liberty St., N.Y.
Guarantee Exterminating Co.,
500—5th Ave., N.Y.

RAT EXTERMINATING PRODUCTS (Cont'd)

Hockwald Chemical Co., 30 Bluxome St.,
San Francisco
J. L. Hopkins & Co., 220 Broadway, N.Y.
Innis, Speiden & Co., 117 Liberty St., N.Y.
See page 40.
Lethelin Products Co., Manhasset, N.Y.
Maywood Pest Exterminators, 1205 S. 1st Ave.,
Maywood, Ill.
Murray & Nickell Mfg. Co.,
2608 Arthington St., Chicago
John Opitz, Inc., Long Island City, N.Y.
Pfaltz & Bauer, Inc., 300 Pearl St., N.Y.
John Powell & Co., 114 E. 32nd St., N.Y.
See pages 51, 52.
Ratin Laboratories, Inc., 112 Broad St., N.Y.
Sennewald Drug Co., 8th & Hickory Sts.,
St. Louis
Soilicide Laboratories, Upper Montclair, N. J.
U. S. Sanitary Specialties Corp.,
435 S. Western Ave., Chicago
Virus Limited, Inc., 10 E. 33rd St., N.Y.

RAT POISONS (see SQUILLS, THALLIUM SULFATE, etc.)**RED OIL (Oleic Acid)***(see also Brokers and Dealers)*

American British Chem. Supplies, Inc.,
180 Madison Ave., N.Y. See page 9.
Celina Stearic Acid Co., Celina, Ohio
Century Stearic Acid Candle Works,
22 E. 40th St., N.Y.
Darling & Co., 4201 S. Ashland Ave., Chicago
Emery Industries, Inc., 4300 Carew Tower,
Cincinnati
A. Gross & Co., 122 E. 42nd St., N.Y.
W. C. Hardesty & Co., 41 E. 42nd St., N.Y.
Harkness & Cowing, Ivorydale, Cincinnati
Procter & Gamble Co., Cincinnati
Theobald Animal By-Products Co.,
Kearny, N.J.
M. Werk Co., St. Bernard, Cincinnati
Wilson-Martin Co., Snyder Ave. &
Swanson St., Philadelphia

REFINING EQUIPMENT (Glycerine)

E. B. Badger Co., 25 Pitts St., Boston
Buffalo Foundry & Machine Co., Buffalo, N.Y.
Consolidated Prods. Co., 15 Park Row, N.Y.
(Used) See page 21.
William Garrigue & Co., 9 S. Clinton St.,
Chicago
Alan Porter Lee, Inc., 136 Liberty St., N.Y.
See page 41.
Lancaster Iron Works, 564 S. Prince St.,
Lancaster, Pa.
Newman Tallow & Soap Machy. Co.,
1051 W. 35th St., Chicago (Used)
See page 45.
Ernest Scott & Co., Fall River, Mass.
Walter E. Simmons Co., Boston
Stein-Brill Corp., 183 Varick St., N.Y.
(Used) See page 65.
Struthers-Wells Co., Warren, Pa.
Swenson Evaporator Co., Harvey, Ill.
Wurster & Sanger, 5201 Kenwood St., Chicago
Zarembo Co., 505 Crosby Bldg., Buffalo, N.Y.

REFRIGERATING EQUIPMENT

York Ice Machine Co., York, Pa.

REMELTERS

Houchin Machinery Co., Hawthorne, N. J.
See page 37.
Huber Machine Co., 259—46th St., Brooklyn
See page 38.
Lancaster Iron Works, 564 S. Prince St.,
Lancaster, Pa.
Patterson Foundry & Mach. Co.,
East Liverpool, O.
Struthers-Wells Co., Warren, Pa.
Wurster & Sanger, Inc., 5201 Kenwood Ave.,
Chicago

RHODINOL (see AROMATIC CHEMICALS)**ROACH POWDER (see HOUSEHOLD INSECTICIDE POWDER)****ROSE OIL (see ESSENTIAL OILS)****ROSEMARY OIL (see ESSENTIAL OILS)****ROSIN**

Antwerp Naval Stores Co., Savannah, Ga.
Continental Turp. & Rosin Corp., Laurel, Miss.
Dixie Pine Prods. Co., Hattiesburg, Miss.
(wood)
General Naval Stores Co.,
230 Park Ave., N.Y. (Wood)
Georgia Rosin Prods. Co., Brunswick, Ga.
Guignon & Green, 17 Battery Pl., N.Y.
Hercules Powder Co.,
Wilmington, Del. (Wood)
Industrial Chem. Sales Co., Inc.,
230 Park Ave., N.Y.
Paper Makers Chemical Corp.,
Kalamazoo, Mich.
Phoenix Naval Stores Co., Gulfport, Miss.
(wood)
Taylor, Lowenstein & Co., Mobile, Ala.
G. A. Wharry & Co., 24 State St., N.Y.

ROTENONE (see DERRIS)**ROTTEN STONE**

Allied Industrial Prods. Co.,
17 N. Elizabeth St., Chicago
Chas. B. Chrystal Co., 11 Park Pl., N.Y.
K. F. Griffiths Co., 110 E. 42nd St., N.Y.
Goris & Arstein, 3700 Racine Ave., Chicago
Hammill & Gillespie, 225 Broadway, N.Y.
National Pumice Stone Co., Inc.,
Foot of Halsey St., Astoria, L. I.
Jas. H. Rhodes & Co., 157 W. Austin Ave.,
Chicago
Tammis Silica Co., 229 N. La Salle St., Chicago
Whittaker Clark & Daniels 245 Front St., N.Y.
Wishnick-Tumpeier, Inc., 295 Madison Ave.,
N.Y.

RUBBER STOPPERS (see LABORATORY APPARATUS)

SAFROL (see AROMATIC CHEMICALS)**SAL SODA***(see also Dealers)*

- American Cyanamid & Chemicals Corp.,
30 Rockefeller Plaza, N.Y.
Church & Dwight Co., 70 Pine St., N.Y.
General Chem. Co., 40 Rector St., N.Y.
See page 31.
**Grasselli Chemical Co., 1800 Guardian Bldg.,
Cleveland**
See page 35.
Innis, Speiden & Co., 117 Liberty St., N.Y.
See page 40.
Mathieson Alkali Works, 60 E. 42nd St., N.Y.
Mechling Bros. Chemical Co., Camden, N.J.
Michigan Alkali Co., 10 E. 40th St., N.Y.
Paper Makers Chemical Corp.,
Kalamazoo, Mich.
Solvay Sales Corp., 40 Rector St., N.Y.
See pages 62, 63.

SALT (Common Salt)*(see also Dealers)*

- Columbia Alkali Co., 30 Rockefeller Plaza, N.Y.
See page 20.
Diamond Alkali Co., First Nat. Bk. Bldg.,
Pittsburgh
Dow Chemical Co., Midland, Mich. See page 25.
Hooker Electrochemical Co.,
60 E. 42nd St., N.Y. See page 36.
International Salt Co., 475—5th Ave., N.Y.
Jefferson Salt & Mining Co., Louisville, Ky.
LeRoy Salt Co., LeRoy, N.Y.
Myles Salt Co., 1007 Camp St.,
New Orleans, La.
Pomeroy Salt Co., Pomeroy, Ohio
Remington Salt Co., Ithaca, N.Y.
Saginaw Salt Prods. Co., Saginaw, Mich.
Solvay Sales Corp., 40 Rector St., N.Y.
See pages 62, 63.

SAMPLE CASES

- Arrow Mfg. Co., 15th & Hudson Sts.,
Hoboken, N. J.
Knickerbocker Case Co., 2311 N. Crawford Ave.,
Chicago

SANDALWOOD OIL

- van Ameringen-Haebler, Inc.,
315—4th Ave., N.Y. See pages 10, 11.
Aromatic Products, Inc., 15 E. 30th St., N.Y.
See page 13.
W. J. Bush & Co., 11 E. 38th St., N.Y.
Cox, Aspden & Fletcher, 39 Cortlandt St., N.Y.
Dodge & Olcott Co., 180 Varick St., N.Y.
P. R. Dreyer Inc., 12 E. 12th St., N.Y.
Fritzsche Brothers, Inc., 76 Ninth Ave., N.Y.
Givaudan-Delawanna, Inc., 80—5th Ave., N.Y.
See inside front cover, 33.
Imperial Export Co., 44 Whitehall St., N.Y.
(Australian)
Magnus, Mabee & Reynard, 32 Cliff St., N. Y.
Orbis Products Corp., 215 Pearl St., N.Y.
See page 4.
Schimmel & Co., 601 W. 26th St., N.Y.
H. C. Ryland, Inc., 161 Water St., N.Y.
Ungerer & Co., 13 W. 20th St., N.Y.
See page facing inside front cover, 68.
Albert Verley, Inc., 11 E. Austin Ave., Chicago
See page 69.

SAPONIN (Ext. Soap Bark)

- Dodge & Olcott Co., 180 Varick St., N.Y.
A. C. Drury & Co., 219 East North Water St.,
Chicago
Fritzsche Brothers, Inc., 76 Ninth Ave., N.Y.
Hoffman-LaRoche, Inc., Nutley, N. J.
Interstate Color Co., 5 Beekman St., N.Y.
Jungmann & Co., 157 Chambers St., N.Y.
See page inside back cover.
Geo. Lueders & Co., 427 Washington St., N.Y.
Merck & Co., Rahway, N. J.
Murray & Nickell Mfg. Co.,
2608 Arthington St., Chicago
S. B. Penick & Co., 132 Nassau St., N.Y.
See page 47.
Pfaltz & Bauer, 300 Pearl St., N.Y.
H. C. Ryland, Inc., 161 Water St., N.Y.
Ungerer & Co., 13 W. 20th St., N.Y.
See page facing inside front cover, 68.

SASSAFRAS (Artificial) (see AROMATIC CHEMICALS)**SCIENTIFIC INSTRUMENTS (see INSTRUMENTS)****SCOURING POWDERS**

- American Soap Powder Wks., Inc.,
98 Van Dyke St., Brooklyn
Baums Castorine Co., 200 Mathew St.,
Rome, N.Y.
Churchill Mfg. Co., 309 Douglas St.,
Sioux City, Ia.
Cincinnati Soap Co., Cincinnati
Du Bois Soap Co., Cincinnati, O.
Fuld Bros., 2308 Frederick Ave., Baltimore
See page 30.
Hockwald Chem. Co., 30 Bluxome St.,
San Francisco
Jansen Soap & Chemical Co.,
324 Leavenworth St., San Francisco, Cal.
Los Angeles Soap Co., Los Angeles
National Milling & Chem. Co., Manayunk,
Phila.
Pacific Chem. Co., 1412 N. Main St.,
Los Angeles
Paper Makers Chemical Corp.,
Kalamazoo, Mich.
Peck's Prods. Co., 5224 N. 2nd St., St. Louis
Poland Soap Works, Anniston, Ala.
Procter & Gamble Co., Cincinnati
Theo. B. Robertson Prods. Co.,
700 W. Division St., Chicago
Solvay Sales Corp., 40 Rector St., N.Y.
See pages 62, 63.
Stevens Soap Corp., 200 Sullivan St., Brooklyn
Swift & Co., Chicago
U. S. Sanitary Specialties Corp.,
435 S. Western Ave., Chicago
Warren Soap Mfg. Co., 51 Waverly St.,
Cambridge, Mass.
Allen B. Wrisley Co., 6801 W. 65th St., Chicago

SCOURING SOAPS (Bars)

- Armour Soap Wks., 1355 W. 31st St., Chicago**
See page 12.
Hewitt Soap Co., Dayton, O.
Los Angeles Soap Co., Los Angeles
National Soap Co., P. O. Box 1613,
Tacoma, Wash.

SCOURING SOAPS (Bars) (Cont'd)

Procter & Gamble, Cincinnati, O.
 Geo. A. Schmidt Co., 236 W. North Ave.,
 Chicago
 John T. Stanley Co., 640 W. 30th St., N.Y.
 Warren Soap Mfg. Co., 51 Waverly St.,
 Cambridge, Mass.
 Allen B. Wrisley Co., 6801 W. 65th St., Chicago

SCREENS (Screening Equipment)

C. O. Bartlett & Snow Co., 6200 Harvard Ave.,
 Cleveland, O.
Consolidated Prods. Co., 15 Park Row, N.Y.
 (Used) See page 21.
 B. F. Gump Co., 431 S. Clinton St., Chicago
 J. H. Day Co., Cincinnati
 J. M. Lehmann Co., 248 W. Broadway, N.Y.
 Ludlow-Sawyer Wire Co., St. Louis, Mo.
Newman Tallow & Soap Machy. Co.,
1051 W. 35th St., Chicago (Used)
 See page 45.

Sprout, Waldron & Co., Muncy, Pa.
 Stedman's Fdy. & Machine Works,
 Aurora, Ind.
Stein-Brill Corp., 183 Varick St., N.Y.
 (Used) See page 65.
 Stephens-Adamson Mfg. Co., Aurora, Ill.
 Sturtevant Mill Co., Boston, Mass.
 W. S. Taylor Co., Cleveland, O.
 Warren Soap Mfg. Co., 51 Waverly St.,
 Cambridge, Mass.
 Wickwire Spencer Steel Co.,
 41 E. 42nd St., N.Y.

SCRUBBING MACHINES (see FLOOR MACHINES)**SCRUBBING SOAPS, LIQUID**

Antiseptol Co., 5524 Northwest Highway,
 Chicago
Armour Soap Wks., 1355 W. 31st St., Chicago
 See page 12.
 Baums Castorine Co., 200 Mathew St.,
 Rome, N.Y.
 Chicago Sanitary Prods. Co.,
 2526 W. Congress St., Chicago
Clifton Chemical Co., 247 Front St., N.Y.
 See page 19.
Davies-Young Soap Co., Dayton, Ohio
 See page 23.
Eagle Soap Corp., Huntington, Ind.
 See page 26.
 Franklin Research Co., 5134 Lancaster Ave.,
 Phila.
Fuld Bros., 2308 Frederick Ave., Baltimore
 See page 30.
James Good, Inc., Kensington, Phila.
 See page 34.
 Goulard & Olena, Inc., 140 Liberty St., N.Y.
 Haag Laboratories, Inc., 6101 S. May St.,
 Chicago
 Harley Soap Co., 2832 E. Pacific St., Phila.
 Hockwald Chem. Co., 30 Bluxome St.,
 San Francisco
 Hubman Supply Co., 225 N. 4th St.,
 Columbus, O.
 Hunt Mfg. Co., Lisbon Rd., Cleveland
 Industrial Labs., 17-19 W. Conway St.,
 Baltimore
 Jansen Soap & Chemical Co.,
 324 Leavenworth St., San Francisco, Cal.

Kemiko Mfg. Co., 191 Murray St.,
 Newark, N. J.
 Kranich Soap Co. 54 Richards St., Brooklyn
 Masury-Young Co., 76 Roland St., Boston
New York Soap Corp., 294 Pearl St., N.Y.
 See page 44.
 North Coast Chem. & Soap Wks.,
 Seattle, Wash.
 Palmer Products, Inc., Waukesha, Wis.
 Paper Makers Chemical Corp.,
 Kalamazoo, Mich.
 Peck's Prods. Co., 522-40 No. 2nd St., St. Louis
 Procter & Gamble Co., Cincinnati, O.
 Theo. B. Robertson Prods. Co.,
 700 W. Division St., Chicago
 U. S. Sanitary Specialties Corp.,
 435 S. Western Ave., Chicago
 Warren Soap Mfg. Co., 51 Waverly St.,
 Cambridge, Mass.

SEALING MACHINERY (Bags)

B. F. Gump Co., 431 S. Clinton St., Chicago
 New Jersey Machine Corp., Hoboken, N. J.
Stokes & Smith Co., 4915 Summerdale Ave.,
 Phila.
 See page 66.

SEALING MACHINERY (Cartons)

Burt Machine Co., 401 E. Oliver St., Baltimore
Consolidated Prods. Co., 15 Park Row, N.Y.
 (Used) See page 21.
 J. L. Ferguson Co., Joliet, Ill.
 Johnson Automatic Sealer Co., Battle Creek,
 Mich.
 R. A. Jones & Co., Cincinnati, O.
 New Jersey Machine Corp., Hoboken, N.J.
Newman Tallow & Soap Machy. Co.,
1051 W. 35th St., Chicago (Used)
 See page 45.

Pneumatic Scale Corp., Norfolk Downs, Mass.
 See pages 48, 49.
 F. B. Redington Co., 112 S. Sangamon St.,
 Chicago
Stein-Brill Corp., 183 Varick St., N.Y.
 (Used) See page 65.
 Stokes & Smith Co., 4915 Summerdale Ave.,
 Phila.
 See page 66.
 Triangle Package Machinery Co.,
 996 Spaulding Ave., Chicago

SEALING MACHINERY (Cases)

H. R. Bliss Co., Niagara Falls, N.Y.
 Burt Machine Co., 401 E. Oliver St., Baltimore
Consolidated Prods. Co., 15 Park Row, N.Y.
 (Used) See page 21.
 J. L. Ferguson Co., Joliet, Ill.
 McStay Machine Co., 3036 E. 5th St.,
 Los Angeles
 J. L. Morrison Co., Niagara Falls, N.Y.
 Nashua Package Sealing Co., Nashua, N. H.
Newman Tallow & Soap Machy. Co.,
1051 W. 35th St., Chicago (Used)
 See page 45.
 Standard Sealing Equipment Corp.,
 Rawson St., Long Island City, N.Y.
Stein-Brill Corp., 183 Varick St., N.Y.
 (Used) See page 65.

SESQUICARBONATE OF SODA (for Bath Salts, etc.), (see SODIUM SESQUICARBONATE)

SHAMPOO BASE

Antiseptol Co., 5524 Northwest Highway,
Chicago

Armour Soap Wks., 1355 W. 31st St., Chicago
See page 12.

Clifton Chemical Co., 247 Front St., N.Y.
See page 19.

Columbia Soap & Chem. Co., Inc.,
324 Leavenworth St., San Francisco

James Counts Soap Co.,
2nd & Washington Aves., St. Louis

Davies-Young Soap Co., Dayton, O.
See page 23.

Eagle Soap Corp., Huntington, Ind.
See page 26.

Fuld Bros., 2308 Frederick Ave., Baltimore
See page 30.

Harley Soap Co., 2832 E. Pacific St., Phila.
Jansen Soap & Chem. Co., 324 Leavenworth St.,
San Francisco

Kranich Soap Co., 54 Richards St., Brooklyn

Los Angeles Soap Co., Los Angeles

New York Soap Corp., 294 Pearl St., N.Y.
See page 44.

Palmer Products, Inc., Waukesha, Wis.
Peck's Prods. Co., 522-40 N. 2nd St., St. Louis

John Powell & Co., 114 E. 32nd St., N.Y.
See pages 51, 52.

Procter & Gamble Co., Cincinnati
Theo. B. Robertson Prods. Co.,
700 W. Division St., Chicago

Geo. A. Schmidt Co., 236 W. North Ave.,
Chicago

U. S. Sanitary Specialties Corp.,
435 S. Western Ave., Chicago

Warren Soap Mfg. Co., 51 Waverly St.,
Cambridge, Mass.

Allen B. Wrisley Co., 6801 W. 65th St., Chicago

SHAMPOOS, LIQUID

Antiseptol Co., 5524 Northwest Highway
Chicago

Armour Soap Wks., 1355 W. 31st St., Chicago
See page 12.

Baums Castorine Co., 200 Mathew St.,
Rome, N.Y.

Bobrick Mfg. Corp., 111 Garey St., Los Angeles
Clifton Chemical Co., 247 Front St., N.Y.
See page 19.

Davies-Young Soap Co., Dayton, O.
See page 23.

Eagle Soap Corp., Huntington, Ind.
See page 26.

Fuld Bros., 2308 Frederick Ave., Baltimore
See page 30.

Harley Soap Co., 2832 E. Pacific St., Phila.
Hockwald Chem. Co., 30 Bluxome St.,
San Francisco

Kranich Soap Co., 54 Richards St., Brooklyn
Los Angeles Soap Co., Los Angeles

New York Soap Corp., 294 Pearl St., N.Y.
See page 44.

North Coast Soap & Chem. Wks.,
Seattle, Wash.

Oil-Kraft, Inc., 3330 Beekman St., Cincinnati
Palmer Products, Inc., Waukesha, Wis.

Peck's Prods. Co., 522-40 N. 2nd St., St. Louis
Procter & Gamble Co., Cincinnati

Theo. B. Robertson Prods. Co.,
700 W. Division St., Chicago

Geo. A. Schmidt Co., 236 W. North Ave.,
Chicago

John T. Stanley Co., 640 W. 30th St., N.Y.

U. S. Sanitary Specialties Corp.,
435 S. Western Ave., Chicago

Vliet Soap Co., 638 Monroe St., Brooklyn

Allen B. Wrisley Co., 6801 W. 65th St., Chicago

SHAMPOOS, POWDER AND CAKE

Cincinnati Soap Co., Cincinnati

Davies-Young Soap Co., Dayton, O.
See page 23.

Lightfoot Schultz Co., 1412 Park Ave.,
Hoboken, N. J.

North Coast Chem. & Soap Wks.,
Seattle, Wash.

Peck's Prods. Co., 522-40 N. 2nd St., St. Louis
John Powell & Co., 114 E. 32nd St., N.Y.
See pages 51, 52.

Geo. A. Schmidt Co., 236 W. North Ave.,
Chicago

Warren Soap Mfg. Co., 51 Waverly St.,
Cambridge, Mass.

Allen B. Wrisley Co., 6801 W. 65th St., Chicago

SHAMPOOS, SOAPLESS

Davies-Young Soap Co., Dayton, O.
See page 23.

Fuld Bros., 2308 Frederick Ave., Baltimore
See page 30.

National Oil Products Co., Harrison, N.J.
Richards Chemical Works, Jersey City, N.J.

**L. Sonneborn Sons, Inc., 88 Lexington Ave.,
N.Y.**
See page 64.

SHAVING CREAM

Cincinnati Soap Co., Cincinnati

Clifton Chemical Co., 247 Front St., N.Y.
See page 19.

Lightfoot Schultz Co., 1412 Park Ave.,
Hoboken, N. J.

Procter & Gamble Co., Cincinnati
Geo. A. Schmidt Co., 236 W. North Ave.,
Chicago

Allen B. Wrisley Co., 6801 W. 65th St., Chicago

SHAVING CREAM BASE

John Powell & Co., 114 E. 32nd St., N.Y.
See pages 51, 52.

Geo. A. Schmidt Co., 236 W. North Ave.,
Chicago

Allen B. Wrisley Co., 6801 W. 65th St., Chicago

SHAVING SOAP, STICKS

Cincinnati Soap Co.,

7th & Elm St., Cincinnati

Colgate-Palmolive-Peet Co., Jersey City, N.J.

J. Eavenson & Sons, Del & Penn. Sts.,
Camden, N. J.

Holman Soap Co., 3100 Fox St., Chicago, Ill.

Lightfoot Schultz Co., 1412 Park Ave.,
Hoboken, N. J.

Los Angeles Soap Co., Los Angeles

Geo. A. Schmidt Co., 236 W. North Ave.,
Chicago

John T. Stanley Co., 640 W. 30th St., N.Y.

Allen B. Wrisley Co., 6801 W. 65th St., Chicago

SHIPPING CASES (see BOXES)

SHEEP DIPS (see CATTLE DIPS)**SHELLAC**

Barrett Varnish Co., 2242 Belmont Ave., Chicago
 Berry Bros., 211 Leib St., Detroit, Mich.
 Chas. Comerford Shellac Co., 509 Third Ave., Brooklyn, N.Y.
 Gillespie-Rogers-Pyatt Co., 80 John St., N.Y.
 A. R. Haeuser Co., 52 Warren St., Brooklyn
 George H. Lincks, 123 Front St., N.Y.
 Mac-Lac Co., Inc., 80 Cliff St., N.Y.
 A. G. Watt Co., 7016 Euclid Ave., Cleveland, O.
 Wm. Zinsser & Co., 516 W. 59th St., N.Y.

SIFTER TOP CANS (see CANS, Sifter Top)**SILICA**

American Colloid Co., 363 W. Superior St., Chicago
 Central Silica Corp., Comer Bldg., Birmingham, Ala.
 Chas. B. Chrystal Co., 11 Park Pl., N.Y.
 Goris & Arnstein, 3700 Racine Ave., Chicago
 K. F. Griffiths & Co., 110 E. 42nd St., N.Y.
 Hammill & Gillespie, 225 Broadway, N.Y.
 Harshaw Chem. Co., Cleveland
 Illinois Silica Co., Cairo, Ill.
 Industrial Chem. Sales Co., Inc., 230 Park Ave., N.Y.
Innis, Speiden & Co., 117 Liberty St., N.Y.
See page 40.
 International Silica Co., Cairo, Ill.
 N. J. Pulverizing Co., 15 Park Row, N.Y.
 Pennsylvania Pulverizing Co., Lewistown, Pa.
 Jas. H. Rhodes & Co., 153 W. Austin Ave., Chicago
 L. A. Salomon & Bro., 216 Pearl St., N.Y.
 Silica Prods. Co., 700 Baltimore Ave., Kansas City, Mo.
 Tamms Silica Co., 228 N. La Salle St., Chicago
 Wishnick-Tumpeer, Inc., 295 Madison Ave., N.Y.

SILICATE OF SODA (see SODIUM SILICATE)**SLABBERS**

Consolidated Prods. Co., 15 Park Row, N.Y.
(Used) *See page 21.*
 Houchin Machinery Co., Hawthorne, N.J.
See page 37.
 Huber Mach. Co., 259—46th St., Brooklyn
See page 38.
 J. M. Lehmann Co., 248 West Broadway, N.Y.
 Newman Tallow & Soap Machinery Co., 1051 W. 35th St., Chicago *(Used)*
See page 45.
 Stein-Brill Corp., 183 Varick St., N.Y.
(New & Used) *See page 65.*

SOAP BARK & EXTRACT (see SAPONIN)**SOAP, CASTILE (see CASTILE SOAP)****SOAP, CHIP (see CHIP SOAP)****SOAP COLORS***(see also Perfuming Compounds)*

American Aniline Prod., Inc., 50 Union Sq., N.Y.
 Stanley Doggett, Inc., 75 Varick St., N.Y.
 A. C. Drury & Co., 219 East North Water St., Chicago
 Dyestuffs & Chemicals, Inc., 11th & Monroe Sts., St. Louis
 Fezandie & Sperrle, 205 Fulton St., N.Y.
 Geigy Co., 89 Barclay St., N.Y.
 General Dyestuffs Corp., 230—5th Ave., N.Y.
 Interstate Color Co., 5 Beekman St., N.Y.
 H. Kohnstamm & Co., 91 Park Pl., N.Y.
 Leebechem Chem. Co., 389 Washington St., N.Y.
 National Aniline & Chem. Co., 40 Rector St., N.Y.
 Pylam Products Co., 799 Greenwich St., N.Y.
See page 55.
 Sandoz Chem. Wks., 61 Van Dam St., N.Y.
 Welch, Holme & Clark Co., Inc., 563 Greenwich St., N.Y. *(Export)*

SOAP DIES

Consolidated Prods. Co., 15 Park Row, N.Y.
(Used) *See page 21.*
 Anthony J. Fries, 717 Sycamore St., Cincinnati
 Houchin Machinery Co., Hawthorne, N.J.
See page 37.
 Huber Mach. Co., 259—46th St., Brooklyn
See page 38.
 Jas. H. Matthews & Co., 3942 Forbes St., Pittsburgh
 Mooney & Bueter, 564 W. Randolph St., Chicago
 I. Schwartz Engraving & Die Works, 38 W. 21st St., N.Y.
 Stein-Brill Corp., 183 Varick St., N.Y.
(Used) *See page 65.*

SOAP DISPENSERS (Liquid)

Bobrick Chemical Corp., 111-117 Garey St., Los Angeles
 Clifton Chemical Co., 247 Front St., N.Y.
See page 19.
 Eagle Soap Corp., Huntington, Ind.
See page 26.
 Fuld Bros., 2308 Frederick Ave., Baltimore
See page 30.
 Garnet Chem. Corp., 911 N. Lumber St., Allentown, Pa.
 Imperial Brass Mfg. Co., 1200 W. Harrison St., Chicago
 Monmouth Prods. Co., 221 E. 131st St., Cleveland
 Moore Bros. Co., 200 Hudson St., N.Y.
 Palmer Products, Inc., Waukesha, Wis.
 U. S. Sanitary Specialties Corp., 435 S. Western Ave., Chicago

SOAP DISPENSERS (Powder)

Bobrick Chemical Corp., 111-117 Garey St., Los Angeles
 Packwood Mfg. Co., St. Louis
 Palmer Products, Inc., Waukesha, Wis.
 Presto Mfg. Co., 4044—20th Ave., S., Minneapolis, Minn.
 Procter & Gamble Co., Cincinnati, O.
 U. S. Sanitary Specialties Corp., 435 S. Western Ave., Chicago
 Vasco Products Co., Elmira, N.Y.

SOAP DISPENSING SYSTEMS (Multi-unit with Tanks)

- Bobrick Chemical Corp., 111-117 Garey St.,
Los Angeles
Clifton Chemical Co., 247 Front St., N.Y.
See page 19.
- Creco Co., Inc., Creco Bldg.,
Long Island City, N.Y.
- Eagle Soap Corp., Huntington, Ind.
See page 26.
- Fuld Bros., 2308 Frederick Ave., Baltimore
See page 30.
- Imperial Brass Mfg. Co., 1200 W. Harrison St.,
Chicago
- Moore Bros. Co., 200 Hudson St., N.Y.
- Palmer Products, Inc., Waukesha, Wis.
- U. S. Sanitary Specialties Corp.,
435 S. Western Ave., Chicago

SOAP DRYERS (see DRYERS)**SOAP, FLAKE (see CHIP SOAP)****SOAP FRAMES (see FRAMES)****SOAP KETTLES (see KETTLES)****SOAP, LINSEED OIL (see LINSEED OIL SOAP)****SOAP MACHINERY**

- Consolidated Prods. Co., 15 Park Row, N.Y.
(Used) See page 21.
- Wm. Garrigue & Co., 9 S. Clinton St., Chicago
- Houchin Machinery Co., Hawthorne, N. J.
See page 37.
- Huber Mach. Co., 259—46th St., Brooklyn
See page 38.
- J. M. Lehmann Co., 248 West Broadway, N.Y.
- Newman Tallow & Soap Machinery Co.,
1051 W. 35th St., Chicago (New & Used)
See page 45.
- Stein-Brill Corp., 183 Varick St., N.Y.
(Used) See page 65.
- Wurster & Sanger, 5201 Kenwood Ave.,
Chicago

SOAP MILLS (see MILLS, TOILET SOAP)**SOAP MIXING DEVICE (for mixing potash, soap and water)**

- Solutionizer Co., 7721 S. State St., Chicago

SOAP PERFUMES

- van Ameringen-Haebler, Inc.,
315—4th Ave., N.Y. See pages 10, 11.
- Aromatic Products, Inc., 15 E. 30th St., N.Y.
See page 13.
- Ph. Chaleyer, Inc., 200 Varick St., N.Y.
- Compagnie Duval, 121 E. 24th St., N.Y.
- Compagnie Parento, Inc.,
Croton-on-Hudson, N.Y.
- Dodge & Olcott Co., 180 Varick St., N.Y.
- P. R. Dreyer Inc., 12 E. 12th St., N.Y.

- A. C. Drury & Co., 219 East North Water St.,
Chicago

- E. I. du Pont de Nemours & Co., Inc.,
Wilmington, Del. See page facing page 1.
- Evergreen Chemical Co., 160—5th Ave., N.Y.
- Felton Chemical Co., 603 Johnson Ave.,
Brooklyn See page 29.
- Chas. Fischbeck Co., 119 W. 19th St., N.Y.
- Fritzsche Brothers, Inc., 76 Ninth Ave., N.Y.
- Givaudan-Delawanna, Inc., 80—5th Ave., N.Y.
See inside front cover, 33

- Heine & Co., 54 Cliff St., N.Y.
- Hymes Bros. Co., 37 Howard St., N.Y.
- Industrial Organics, 151 W. 25th St., N.Y.
- Lanvoix Chemical Co., 549 W. Randolph St.,
Chicago
- Lautier Fils, 158 W. 18th St., N.Y.
- Geo. Lueders & Co., 427 Washington St., N.Y.
- Magnus, Mabce & Reynard, 32 Cliff St., N.Y.
- Neumann-Buslee & Wolfe, 224 W. Huron St.,
Chicago

- Orbis Products Corp., 215 Pearl St., N.Y.

See page 4.

- Pfaltz & Bauer, Inc., 300 Pearl St., N.Y.
- Polak's Frutal Wks., Inc., 350 W. 31st St., N.Y.
- Riviera Prods. Co., 215 W. Ohio St., Chicago
- H. C. Ryland, Inc., 161 Water St., N.Y.
- Schimmel & Co., 601 W. 26th St., N.Y.
- C. A. Seguin Co., 500 N. Dearborn St., Chicago
- Edwin Seebach Co., 912 Broadway, N.Y.
- William G. Sibbach & Co., Maywood, Ill.
- Synfleur Scientific Labs., Monticello, N.Y.
- Ungerer & Co., 13 W. 20th St., N.Y.

See page facing inside front cover, 68.

- Van Dyk & Company, 57 Wilkinson Ave.,
Jersey City, N. J.

- Albert Verley, Inc., 11 E. Austin Ave., Chicago
See page 69.

SOAP PLANTS (Complete)

- Consolidated Prods. Co., 15 Park Row, N.Y.
(Used) See page 21.
- Wm. Garrigue & Co. 9 So. Clinton St., Chgo.
- Houchin Machinery Co., Hawthorne, N.J.
See page 37.
- Huber Mach. Co., 259—46th St., Brooklyn
See page 38.
- Alan Porter Lee, Inc., 136 Liberty St., N.Y.
See page 41.
- J. M. Lehmann Co., 248 W. Broadway, N.Y.
- Newman Tallow & Soap Machv. Co.,
1051 W. 35th St., Chicago (Used) See page 45.
- Stein-Brill Corp., 183 Varick St., N.Y.
(Used) See page 65.
- Wurster & Sanger, 5201 Kenwood Ave.,
Chicago

SOAP POWDER MILLS (see MILLS, SOAP POWDER)**SOAP, POWDERED (White neutral powdered soap. Do not confuse with Soap Powders.)**

- Armour Soap Wks., 1355 W. 31st St., Chicago
See page 12.
- J. L. Hopkins & Co., 220 Broadway, N.Y.
- H. Kohnstamm & Co., 91 Park Pl., N.Y.
- Kranich Soap Co., 54 Richards St., Brooklyn,
N.Y.
- Lightfoot Schultz Co., 1412 Park Ave.,
Hoboken, N. J.
- Los Angeles Soap Co., Los Angeles
- Murray & Nickell Mfg. Co.,
2608 Arthington St., Chicago

SOAP, POWDERED, (Cont'd)

Peck & Velsor, 76 William St., N.Y.
 S. B. Penick & Co., 132 Nassau St., N.Y.
 See page 47.
 John Powell & Co., 114 E. 32nd St., N.Y.
 See pages 51, 52.
 R. J. Prentiss & Co., 100 Gold St., N.Y.
 See page 53.
 Procter & Gamble Co., Cincinnati
 Geo. A. Schmidt Co., 236 W. North Ave.,
 Chicago
 Swift & Co., Union Stock Yards, Chicago
 Warren Soap Mfg. Co., 51 Waverly St.,
 Cambridge, Mass.
 Allen B. Wrisley Co., 6801 W. 65th St., Chicago

SOAP POWDERS

(Do not confuse with powdered white soap)

American Soap Powder Wks., Inc.,
 98 Van Dyk St., Bklyn.
 Armour Soap Wks., 1355 W. 31st St., Chicago
 See page 12.
 Baums Castorine Co., 200 Mathew St.,
 Rome, N.Y.
 Cincinnati Soap Co., Cincinnati
 Du Bois Soap Co., Cincinnati
 J. Eavenson & Sons, Del. & Penn. Sts.,
 Camden, N. J.
 Hewitt Soap Co., Dayton, O.
 H. Kohnstamm & Co., 91 Park Pl., N.Y.
 Lever Brothers Co., Cambridge, Mass.
 Geo. E. Marsh Co., 200 Broadway, Cambridge,
 Mass.
 National Milling & Chem. Co.,
 Manayunk, Phila.
 North Coast Soap & Chem. Wks.,
 Seattle, Wash.
 Paper Makers Chemical Corp.,
 Kalamazoo, Mich.
 Peck's Prods. Co., 522-40 N. 2nd St., St. Louis
 Procter & Gamble Co., Cincinnati
 Stevens Soap Corp., 200 Sullivan St., Brooklyn
 Swift & Co., Union Stock Yards, Chicago
 Vasco Prods. Co., Elmira, N.Y.
 Vliet Soap Co., 638 Monroe St., Brooklyn
 Warren Soap Mfg. Co., 51 Waverly St.,
 Cambridge, Mass.
 M. Werk Co., St. Bernard, Cincinnati
 Chas. W. Young & Co., Phila.

SOAP PRESSES (see PRESSES)**SOAP SHEETS (Soap Paper)**

Moore Bros. Co., 200 Hudson St., N.Y.
 Rosefelt Sales Builders, 740 N. Plankinton Ave.,
 Milwaukee, Wisc.

SOAP SLABBERS (see SLABBERS)**SOAP STOCK**

(see also Brokers and Dealers)

Durkee Famous Foods, Inc., 2670 Elston Ave.,
 Chicago
 Portsmouth Cotton Oil Refining Co.,
 Portsmouth, Va.
 Procter & Gamble Co., Cincinnati, O.
 Rayner & Stonington, 79 Wall St., N.Y.
 Snow & Cleaver, Inc., 15 William St., N.Y.
 See page facing 3rd cover.

Southern Cotton Oil Co.,
 Produce Exchange, N.Y.
 Staley Sales Corp., Decatur, Ill.
 G. A. Wharry & Co., 24 State St., N.Y.

SOAP, WHALE OIL (see WHALE OIL SOAP)**SOAPS, AUTO (see AUTO SOAPS)****SOAPS, FLOATING (see FLOATING SOAPS)****SOAPS, LIQUID (see LIQUID SOAPS, LIQUID SOAP BASE, etc.)****SOAPS, MEDICINAL, CAKE (see MEDICINAL SOAPS, CAKE)****SOAPS, MOTTLED (see MOTTLED SOAPS)****SOAPS, PINE SCRUB (see SCRUBBING SOAPS)****SOAPS, SCOURING (see SCOURING SOAPS)****SOAPS, SCRUBBING (see SCRUBBING SOAPS)****SOAPS, SURGICAL (see SURGICAL SOAPS)****SOAPS, TEXTILE (see TEXTILE SOAPS)****SODA ASH**

(see also Dealers)

American Cyanamid & Chem. Corp.,
 30 Rockefeller Plaza, N.Y.
 Columbia Alkali Co., 30 Rockefeller Plaza, N.Y.
 See page 20.
 Diamond Alkali Co., 1st Nat'l Bank Bldg.,
 Pittsburgh
 Innis, Speiden & Co., 117 Liberty St., N.Y.
 See page 40.
 Mathieson Alkali Wks., 60 E. 42nd St., N.Y.
 Michigan Alkali Co., 60 E. 42nd St., N.Y.
 Niagara Alkali Co., 9 E. 41st St., N.Y.
 See page 46.
 Solvay Sales Corp., 40 Rector St., N.Y.
 See pages 62, 63.

SODA (Modified)

(see also Dealers)

American Cyanamid & Chem. Corp.,
 30 Rockefeller Plaza, N.Y.
 Columbia Alkali Co., 30 Rockefeller Plaza, N.Y.
 See page 20.
 Diamond Alkali Co., 1st Nat'l Bank Bldg.,
 Pittsburgh
 Innis, Speiden & Co., 117 Liberty St., N.Y.
 See page 40.
 H. Kohnstamm & Co., 91 Park Pl., N.Y.
 Mathieson Alkali Wks., 60 E. 42nd St., N.Y.

SODA (Modified) (Cont'd)

Mechling Bros. Chemical Co.,
Line St. & Coopers Creek, Camden, N.J.
Michigan Alkali Co., 60 E. 42nd St., N.Y.
Philadelphia Quartz Co., 121 S. 3rd St.,
Philadelphia, Pa.
Solvay Sales Corp., 40 Rector St., N.Y.
See pages 62, 63.

SODIUM BICARBONATE*(see also Dealers)*

American Cyanamid & Chem. Corp.,
30 Rockefeller Plaza, N.Y.
Church & Dwight Co., 70 Pine St., N.Y.
Diamond Alkali Co., 1st Nat'l Bank Bldg.,
Pittsburgh
Grasselli Chemical Co., 1300 Guardian Bldg.,
Cleveland See page 35.
Innis, Speiden & Co., 117 Liberty St., N.Y.
See page 40.
Mathieson Alkali Works, 60 E. 42nd St., N.Y.
Mechling Bros. Chemical Co.,
Line St. & Coopers Creek, Camden, N.J.
Michigan Alkali Co., 60 E. 42nd St., N.Y.
Monsanto Chem. Co., 30 Rockefeller Plaza,
N.Y.
Pennsylvania Salt Mfg. Co., Widener Bldg.,
Philadelphia
Victor Chem. Wks., 141 W. Jackson Blvd.,
Chicago, Ill.

SODIUM BICHROMATE*(see also Dealers)*

American Cyanamid & Chem. Corp.,
30 Rockefeller Plaza, N.Y.
Grasselli Chemical Co., 1300 Guardian Bldg.,
Cleveland See page 35.
Innis, Speiden & Co., 117 Liberty St., N.Y.
See page 40.
Mutual Chemical Co., 270 Madison Ave., N.Y.
Natural Products Refining Co.,
900 Garfield Ave., Jersey City, N. J.

SODIUM CHOLATE (Bile Salt)

American Cyanamid & Chem. Corp.,
30 Rockefeller Plaza, N.Y.
Digestive Ferments Co., Detroit
R. W. Greeff & Co., 10 E. 40th St., N. Y.
Wilson Labs., 4221 S. Western Ave., Chicago

SODIUM FLUORIDE*(see also Dealers)*

American Cyanamid & Chem. Corp.,
30 Rockefeller Plaza, N.Y.
American Fluoride Corp.,
151 W. 19th St., N.Y.
General Chemical Co., 40 Rector St., N.Y.
See page 31.
Harshaw Chemical Co., 1945 E. 97th St.,
Cleveland
Innis, Speiden & Co., 117 Liberty St., N.Y.
See page 40.
Jungmann & Co., 157 Chambers St., N.Y.
See inside back cover.
Merck & Co., Rahway, N. J.
Pfaltz & Bauer, 300 Pearl St., N.Y.
Wiarda & Hall-Acid Wks., 514 Gardner Ave.,
Brooklyn, N.Y.

SODIUM FLUOSILICATE (see SODIUM SILICOFLUORIDE)**SODIUM HYDROSULFITE**

American Cyanamid & Chem. Corp.,
30 Rockefeller Plaza, N.Y.
J. T. Baker Chem. Co., Phillipsburg, N. J.
E. I. du Pont de Nemours & Co.,
Wilmington, Del.
General Dyestuffs Corp., 230—5th Ave., N.Y.
Grasselli Chem. Co., 1300 Guardian Bldg.,
Cleveland See page 35.
Jungmann & Co., 157 Chambers St., N.Y.
See inside back cover.
Rohm & Haas Co., Inc.,
222 W. Washington Sq., Phila.
See pages 58, 59.
Royce Chemical Co., Carlton Hill, N.J.

SODIUM LAUURL SULFATE (see SULFONATED FATTY ALCOHOLS)**SODIUM METAPHOSPHATE**

Buromin Co., Bowman Bldg., Pittsburgh
Alex. C. Fergusson Co., 450 Chestnut St.,
Phila.
Victor Chem. Wks., 141 W. Jackson Blvd.,
Chicago

SODIUM METASILICATE

Cowles Detergent Co., 10525 Carnegie Ave.,
Cleveland
General Chem. Co., 40 Rector St., N.Y.
See page 31.
Grasselli Chem. Co., 1300 Guardian Bldg.,
Cleveland See page 35.
Mechling Bros. Chemical Co., Camden, N.J.
Philadelphia Quartz Co., 121 So. 3rd St., Phila.
Standard Silicate Co., 2718 Koppers Bldg.,
Pittsburgh

SODIUM NAPHTHENATE

E. I. du Pont de Nemours & Co.,
Wilmington, Del.
General Dyestuffs Corp., 230—5th Ave., N.Y.
National Aniline & Chem. Co., 40 Rector St.,
N.Y.

SODIUM PERBORATE*(see also Dealers)*

American Cyanamid & Chem. Corp.,
30 Rockefeller Plaza, N.Y.
E. I. du Pont de Nemours & Co.,
Wilmington, Del.
Grasselli Chem. Co., 1300 Guardian Bldg.,
Cleveland See page 35.
Innis, Speiden & Co., 117 Liberty St., N.Y.
See page 40.

SODIUM SESQUICARBONATE

Diamond Alkali Co., 1st Nat'l Bank Bldg.,
Pittsburgh
Mathieson Alkali Wks., 60 E. 42nd St., N.Y.
Mechling Bros. Chemical Co.,
Line St. & Coopers Creek, Camden, N.J.
Solvay Sales Corp., 40 Rector St., N.Y.
See pages 62, 63.

SODIUM SESQUISILICATE

Philadelphia Quartz Co., 121 S. 3rd St., Phila.

SODIUM SILICATE

(see also Dealers)

General Chemical Co., 40 Rector St., N.Y.

See page 31.

Grasselli Chemical Co., 1300 Guardian Bldg.,

Cleveland

See page 35.

Meching Bros. Chem. Co., Camden, N. J.

Philadelphia Quartz Co., 121 S. 3rd St.,

Philadelphia

Standard Silicate Co., 2718 Koppers Bldg.,

Pittsburgh

SODIUM SILICOFLOURIDE

American-British Chem. Supplies, Inc.,

180 Madison Ave., N.Y.

See page 9.

American Cyanamid & Chem. Corp.,

30 Rockefeller Plaza, N.Y.

American Fluoride Corp.,

151 W. 19th St., N.Y.

Blockson Chemical Co., Joliet, Ill.

Grasselli Chemical Co., 1300 Guardian Bldg.,

Cleveland

See page 35.

Harshaw Chemical Co., 1945 E. 97th St.,

Cleveland

Innis, Speiden & Co., 117 Liberty St., N.Y.

See page 40.

Jungmann & Co., 157 Chambers St., N.Y.

See inside back cover.

Merck & Co., Rahway, N. J.

Pfaltz & Bauer, Inc., 300 Pearl St., N.Y.

SOLVENT NAPHTHA

Barrett Co., 40 Rector St., N.Y. See page 16.

S. H. Bell Co., 1407 Gulf Bldg., Pittsburgh

Deep Rock Oil Corp., 155 N. Clark St., Chicago

Wm. E. Jordan & Bro., 2590 Atlantic Ave.,

Brooklyn

Koppers Products Co., Pittsburgh

Neville Chemical Co., Pittsburgh

Reilly Tar & Chem. Corp., P. O. Box 125,

Indianapolis

See page 56.

Shell Petroleum Corp., Shell Bldg., St. Louis

SOLVENTS, ORGANIC

Carbide & Carbon Chem. Corp., 30 E. 42nd St., N.Y.

Dow Chemical Co., Midland, Mich. See page 25.

E. I. du Pont de Nemours & Co.,

Wilmington, Del.

Sharples Solvents Corp., Phila.

Warner Chemical Co., 405 Lexington Ave.,

N.Y.

See page 70.

SOLVENTS, PETROLEUM

American Mineral Spirits Co.,

330 S. Michigan Ave., Chicago

Anderson-Pritchard Oil Co., Oklahoma City,

Okla.

Deep Rock Oil Corp., 155 N. Clark St., Chicago

Skelly Oil Corp., 2534 Madison Ave.,

Kansas City, Mo.

Sinclair Refining Co., 630—5th Ave., N.Y.

L. Sonneborn Sons, 88 Lexington Ave., N.Y.

See page 64.

SOYA BEAN OIL

(see also Brokers and Dealers)

Balfour, Guthrie Co., 67 Wall St., N.Y.

Irving R. Boody & Co., 99 Wall St., N.Y.

Durkee Famous Foods, Inc., 2670 Elston Ave.,

Chicago

William O. Goodrich Co., Milwaukee, Wis.

W. R. Grace & Co., 7 Hanover Sq., N.Y.

Otto A. C. Hagen Co., 929 Ledger Bldg.,

Phila.

Spencer Kellogg & Son, Buffalo, N.Y.

Mitsubishi Shoji Kaisha, 120 Broadway, N.Y.

Mitsui & Co., 350—5th Ave., N.Y.

Murray Oil Products Co., 21 West St., N.Y.

Purina Mills, St. Louis

J. H. Redding Co., 17 Battery Pl., N.Y.

Smith-Weihman Co., 15 Moore St., N.Y.

See page 61.

Snow & Cleaver, Inc., 15 William St., N.Y.

See page facing 3rd cover.

Staley Sales Corp., Decatur, Ill.

Wilbur-Ellis Co., 17 Battery Pl., N.Y.

See page 71.

SPERMACETI

E. A. Bromund Co., 258 Broadway, N.Y.

A. C. Drury & Co., 219 East North Water St.,

Chicago

Innis, Speiden & Co., 117 Liberty St., N.Y.

See page 40.

Neumann-Buslee & Wolfe, 224 W. Huron St.,

Chicago, Ill.

Orbis Products Corp., 215 Pearl St., N.Y.

See page 4.

L. A. Salomon & Bro. 216 Pearl St., N.Y.

Werner G. Smith Co., 2191 W. 110th St.,

Cleveland

Smith & Nichols, 121 Maiden Lane, N.Y.

Sirohmeyer & Arpe Co.,

139 Franklin St., N.Y.

Will & Baumer Candle Co., Syracuse, N.Y.

SPONGES

Allied Industrial Prods. Co.,

17 N. Elizabeth St., Chicago

American Sponge & Chamois Co.,

47 Ann St., N.Y.

American Standard Mfg. Co.,

2509 Lime St., Chicago

Atlas Sponge Co., 291 Church St., N.Y.

Florida Sponge & Chamois Co.,

42 Cliff St., N.Y.

Great Eastern Sponge & Chamois Co.,

833 N. Catt. Pk. Ave., Baltimore

James H. Rhodes & Co., 157 Austin Ave.,

Chicago

Robinson Sponge Co., 1727 Atlantic Ave.,

Brooklyn

SPOTTING FLUIDS (see CLEANING FLUIDS)**SPRAY PERFUMES (see PERFUMING COMPOUNDS)****SPRAY POWDERS (see SOAP POWDERS)****SPRAYERS, COMPRESSED AIR**

Aceline, Inc., Traverse City, Mich.

Binks Mfg. Co., 3114 Carroll Ave., Chicago

Breuer Electric Mfg. Co., 852 Blackhawk St.,

Chicago

See page 17.

E. C. Brown Co., Rochester, N.Y.

De Vilbiss Co., Toledo, O.

SPRAYERS, COMPRESSED AIR, (Cont'd)

Dobbins Mfg. Co., North St. Paul St., Minn.
Electric Sprayit Co., 220 N. Broadway,
Milwaukee, Wisc.
Hudson Mfg. Co., 589 E. Illinois St., Chicago
See page 39.
Imperial Brass Mfg. Co., 1200 W. Harrison St.,
Chicago
Lowell Sprayer Co., Lowell, Mich.
D. B. Smith & Co., Utica, N.Y.
Simmons Paint Spray Brush Co., Dayton, O.

SPRAYERS, CONTINUOUS HAND

Acemeline, Inc., Traverse City, Mich.
E. C. Brown Co., Rochester, N.Y.
Continental Can Co., Inc.,
100 E. 42nd St., N.Y. See page 22.
Dobbins Mfg. Co., North St. Paul, Minn.
Electric Sprayit Co., 220 N. Broadway,
Milwaukee, Wisc.
Hudson Mfg Co., 589 E. Illinois St., Chicago
See page 39.
Jaekkh Mfg. Co., Cincinnati
Lowell Sprayer Co., Lowell, Mich.
D. B. Smith & Co., Utica, N.Y.
Volume Sprayer Mfg. Co., Tulsa.

SPRAYERS, ELECTRIC

Binks Mfg. Co., 3114 Carroll Ave., Chicago
Breuer Electric Mfg. Co., 852 Blackhawk St.,
Chicago See page 17.
Dobbins Mfg. Co., North St. Paul, Minn.
Electric Sprayit Co., 220 N. Broadway,
Milwaukee, Wisc.
Hudson Mfg. Co., 589 E. Illinois St., Chicago
See page 39.
Lowell Sprayer Co., Lowell, Mich.
Metal Specialties Mfg. Co., 3208 Carroll Ave.,
Chicago
D. B. Smith Co., Utica, N.Y.

SPRAYERS, ELECTRIC STEAM

Electric Sprayit Co., 220 N. Broadway,
Milwaukee, Wisc.
Kaz Mfg. Co., 369 Lexington Ave., N.Y.

SPRAYERS, for Powders (see Bellows)**SPRAYERS, HAND**

Acemeline, Inc., Traverse City, Mich.
E. C. Brown Co., Rochester, N.Y.
Continental Can Co., 100 E. 42nd St., N.Y.
See page 22.
Dobbins Mfg Co., North St. Paul, Minn.
Electric Sprayit Co., 220 N. Broadway,
Milwaukee, Wisc.
Hudson Mfg. Co., 589 E. Illinois St., Chicago
See page 39.
Jaekkh Mfg. Co., Cincinnati
Lowell Sprayer Co., Lowell, Mich.
D. B. Smith Co., Utica, N.Y.
Volume Sprayer Mfg. Co., Tulsa

SPRAYERS, MOUTH

Larvex Corp., Chrysler Bldg., N.Y.
Lowell Sprayer Co., Lowell, Mich.
D. B. Smith & Co., Utica, N.Y.

SQUILLS (Rodent Poison)

J. L. Hopkins & Co., 220 Broadway, N.Y.
McLaughlin Gormley King Co.,
1715—5th St., S. E., Minneapolis, Minn.
Murray & Nickell Mfg. Co.,
2608 Arthington St., Chicago
S. B. Penick & Co., 132 Nassau St., N.Y.
See page 47.
John Powell & Co., 114 E. 32nd St., N.Y.
See pages 51, 52.
R. J. Prentiss & Co., 100 Gold St., N.Y.
See page 53.

STARCH*(see also Dealers)*

American Cyanamid & Chem. Corp.,
30 Rockefeller Plaza, N.Y.
Arabol Mfg. Co., 110 E. 42nd St., N.Y.
Chicago Starch Co., 2708 S. Throop St.,
Chicago
A. C. Drury & Co., 219 E. N. Water St.,
Chicago
Innis, Speiden & Co., 117 Liberty St., N.Y.
See page 40.
Keever Starch Co., Columbus, O.
H. Kohnstamm & Co., 91 Park Pl., N.Y.
National Adhesives Corp.,
820 Greenwich St., N.Y.
Staley Sales Corp., Decatur, Ill.

**STEAM SPRAYERS (see SPRAYERS,
ELECTRIC, STEAM)****STEARATES***(see also Dealers)*

Franks Chem. Prods. Co.,
55—33rd St., Brooklyn
Harshaw Chemical Co., 1945 E. 97th St.,
Cleveland
Innis, Speiden & Co., 117 Liberty St., N.Y.
See page 40.
Mallinckrodt Chem. Wks., St. Louis
Metasap Chemical Co., Harrison, N. J.
M. W. Parsons, Inc., 55 Ann St., N.Y.

STEARIC ACID*(see also Brokers and Dealers)*

American-British Chem. Supplies, Inc.,
180 Madison Ave., N.Y. See page 9.
Celina Stearic Acid Co., Celina, Ohio
Century Stearic Acid Candle Wks.,
22 E. 40th St., N.Y.
Darling & Co., 4201 S. Ashland Ave., Chicago
Emery Industries, Inc., 4300 Carew Tower,
Cincinnati
A. Gross & Co., 122 E. 42nd St., N.Y.
Harkness & Cowing, Ivorydale, Cincinnati
Innis, Speiden & Co., 117 Liberty St., N.Y.
See page 40.
Orbis Products Corp., 215 Pearl St., N.Y.
See page 4.
Procter & Gamble Co., Cincinnati
Theobald Animal By-Products Co.,
Kearny, N.J.
M. Werk Co., St. Bernard, Cincinnati
Will & Baumer Candle Co., Syracuse, N.Y.
Wilson-Martin Co., Snyder Ave. &
Swanson St., Philadelphia
Wishnick-Tumpeer, Inc., 295 Madison Ave.,
N.Y.

STEARINE*(see also Brokers and Dealers)*

- Celina Stearic Acid Co., Celina, Ohio
 Durkee Famous Foods, Inc., 2670 Elston Ave., Chicago
 Emery Industries, Inc., 4300 Carew Tower, Cincinnati
 Independent Mfg. Co., Bridesburg P. O., Phila.
 Morris & Co., Union Stock Yards, Chicago
 Procter & Gamble Co., Cincinnati
 Smith-Weihman Co., 15 Moore St., N.Y.
 See page 61.
 Snow & Cleaver, Inc., 15 William St., N.Y.
 See page facing 3rd cover.
 Louis Stern Sons, Inc., Produce Exch., N.Y.
 Swift & Co., Union Stock Yards, Chicago
 Wilson & Co., 4100 Ashland Ave., Chicago

STEEL, CORROSION-RESISTANT

- Illinois Steel Co., 208 S. La Salle St., Chicago
 Lukens Steel Co., Coatesville, Pa.

STEEL DRUMS (see DRUMS, STEEL)**STEEL PAILS (see PAILS, STEEL)****STEEL TANKS (see TANKS, STEEL)****STEEL WOOL**

- Allied Industrial Products Co.,
 19 N. Elizabeth St., Chicago
 American Steel Wool Mfg. Co.,
 9 Desbrosses St., N.Y.
 International Steel Wool Co., Springfield, Ohio
 James H. Rhodes & Co., W. Austin Ave., Chicago
 Whiskette Co., Terre Hill, Pa.

STORAGE TANKS (see TANKS, STORAGE, etc.)**SULFONATED OILS**

- American Cyanamid & Chem. Corp.,
 30 Rockefeller Plaza, N.Y.
 Kali Mfg. Co., 1408 N. Front St., Philadelphia
 National Oil Products Co., Harrison, N. J.
 Paper Makers Chemical Corp.,
 Kalamazoo, Mich.
 Richards Chemical Works, Jersey City, N.J.
 L. Sonneborn Sons, Inc., 88 Lexington Ave., N.Y.
 See page 64.
 Wecoline Prods. Co., 15 E. 26th St., N.Y.
 Jacques Wolfe & Co., Passaic, N.J.

SULFONATED FATTY ALCOHOLS

- E. I. du Pont de Nemours & Co.,
 Wilmington, Del.
 General Dyestuffs Corp., 230-5th Ave., N.Y.
 Hummel Chemical Co., 90 West St., N.Y.
 National Aniline & Chem. Co., 40 Rector St., N.Y.
 Procter & Gamble Co., Cincinnati
 Jacques Wolfe & Co., Passaic, N.J.

SULFOXYLATES (Soap Bleaches)

- Rohm & Haas Co., Inc.,
 222 W. Washington Sq., Phila.
 See pages 58, 59.
 Jacques Wolfe & Co., Passaic, N.J.

SULFUR CANDLES

- White Tar Co., Kearny, N. J.

SUPERFATTING AGENTS

- Pfaltz & Bauer, 300 Pearl St., N.Y.
 Pylam Products Co., 799 Greenwich St., N.Y.
 See page 55.
 Welch, Holme & Clark Co., Inc.,
 563 Greenwich St., N.Y.

SUPERHEATERS

- Eureka Machine Co., 2601 Vega Ave., Cleveland
 William Garrigue & Co., 9 S. Clinton St., Chicago
 Ernest Scott & Co., Fall River, Mass.
 The Superheater Co., 17 E. 42nd St., N.Y.
 Wurster & Sanger, 5201 Kenwood Ave., Chicago

SURGICAL SOAPS

- Armour Soap Wks., 1355 W. 31st St., Chicago
 See page 14.
 Clifton Chem. Co., 247 Front St., N.Y.
 See page 12.
 Davies-Young Soap Co., Dayton, O.
 See page 23.
 Eagle Soap Corp., Huntington, Ind.
 See page 26.
 Fuld Bros., 2308 Frederick Ave., Baltimore
 See page 30.
 Harley Soap Co., 2832 E. Pacific St., Phila.
 Jansen Soap & Chem. Co., 324 Leavenworth St., San Francisco
 Kranich Soap Co., 54 Richards St., Brooklyn
 Procter & Gamble Co., Cincinnati
 Theo. B. Robertson Prods. Co.,
 700 W. Division St., Chicago
 Geo. A. Schmidt Co., 236 W. North Ave., Chicago
 Solshine Mfg. Co., 44 Brookline St., Cambridge, Mass.
 U. S. Sanitary Specialties Corp.,
 435 S. Western Ave., Chicago
 Warren Soap Mfg. Co., 51 Waverly St., Cambridge, Mass.

SWEEPING COMPOUNDS

- Champion Mfg. Co., 322 S. Erie St., Indianapolis, Ind.
 Chicago Sanitary Prods. Co.,
 2526 W. Congress St., Chicago
 Creco Co., Inc., Creco Bldg., Long Island City, N.Y.
 Fuld Bros., 2308 Frederick Ave., Baltimore
 See page 30.
 Globe Sanitary Supply Co., 2249 E. 38th St., Los Angeles
 Hubman Supply Co., 225 N. 4th St., Columbus, O.
 North Coast Soap & Chem Wks., Seattle, Wash.

SWEEPING COMPOUNDS, (Cont'd)

Pacific Chem. Co., 1421 N. Main St.,
Los Angeles
Palmer Products, Inc., Waukesha, Wis.
Theo. B. Robertson Prods. Co.,
700 W. Division St., Chicago
Sanco Prods. Inc., Greenville, O.
Uncle Sam Chemical Co., 329 E. 29th St., N.Y.
U. S. Sanitary Specialties Corp.,
435 S. Western Ave., Chicago
Veteran Dust Exterminator Co.,
419 Broome St., N.Y.

TALC

American Cyanamid & Chem. Corp.,
30 Rockefeller Plaza, N.Y.
Binney & Smith Co., 41 E. 42nd St., N.Y.
Blue Ridge Talc Co., Henry, Va.
Chas. B. Chrystal Co., 11 Park Place, N.Y.
A. C. Drury & Co., 219 East North Water St.,
Chicago
Eastern Magnesia Talc Co., Burlington, Vt.
Fezandie & Sperrle, 205 Fulton St., N.Y.
Georgia Talc Co., Asheville, N. C.
Goris & Arnstein, 37th & Racine Ave., Chicago
Hammill & Gillespie, 225 Broadway, N.Y.
Innis, Speiden & Co., 117 Liberty St., N.Y.
See page 40.
Los Angeles Talc Co., Los Angeles, Cal.
Charles Mathieu, Inc., 24 Stone St., N.Y.
Natural Products Co., 307 W. 8th St.,
Los Angeles
Pacific Coast Talc Co., Los Angeles, Cal.
L. A. Salomon & Bro., 216 Pearl St., N.Y.
E. M. Sergeant Pulp & Chemical Co.,
350—5th Ave., N.Y.
Union Talc Co., 147 Nassau St., N.Y.
Welch, Holme & Clark Co., Inc.,
563 Greenwich St., N.Y.
Whittaker, Clark & Daniels, 245 Front St., N.Y.
Wishnick-Tumpeer, Inc., 295 Madison Ave.,
N.Y.

TALLOW(see also *Brokers and Dealers*)

Armour & Co., 1355 W. 31st St., Chicago
See page 12.
Belleville Rendering Co., Belleville, Ill.
Consolidated Rendering Co., 40 N. Market St.,
Boston
Cudahy Packing Co., 111 W. Monroe St.,
Chicago
Darling & Co., 4201 So. Ashland Ave.,
Chicago
Eastern Industries, Inc., 125 Bergen St.,
Harrison, N. J.
Independent Mfg. Co., Bridesburg P. O., Phila.
Louisville Butchers' Hide & Tallow Co.,
Louisville, Ky.
Snow & Cleaver, Inc., 15 William St., N.Y.
See page facing 3rd cover.
Louis Stern Sons, Inc.,
Produce Exchange, N.Y.
Swift & Co., Union Stock Yards, Chicago
Theobald Animal By-Products Co.,
Kearny, N.J.
Toledo Tallow Co., Toledo, Ohio
Waltham Tallow Co., Waltham, Mass.
Wilbur-Ellis Co., 17 Battery Pl., N.Y.
See page 71.
Wilson & Co., Union Stock Yards, Chicago
Wilson-Martin Co., Swanson St., Phila.

TALLOW CHIP SOAP (see CHIP SOAPS)**TALLOW OIL**(see also *Brokers and Dealers*)

Armour & Co., 1355 W. 31st St., Chicago
See page 12.
Consolidated Rendering Co., 40 N. Market St.,
Boston
Cudahy Packing Co., 111 W. Monroe St.,
Chicago
Independent Mfg. Co., Bridesburg P. O., Phila.
Louis Stern Sons, Inc.,
Produce Exchange, N.Y.
Toledo Tallow Co., Toledo, O.
Waltham Tallow Co., Waltham, Mass.
Wilson & Co., Union Stock Yards, Chicago

TANKS (Glass Lined Mixing and Storage)

Alsop Engineering Corp., 39 W. 60th St., N.Y.
See page 6, 7.
Consolidated Prods. Co., 15 Park Row, N.Y.
(Used) See page 21.
Ertel Engineering Corp., 120 E. 16th St., N.Y.
See page 27.
Metal Glass Products Corp., Belding, Mich.
Mixing Equipment Co., 1024 Garson Ave.,
Rochester, N.Y.
Newman Tallow & Soap Machy Co.,
1051 W. 35th St., Chicago (Used)
See page 45.
Pfaudler Co., 89 East Ave., Rochester, N.Y.
Scientific Filter Co., 1 Franklin Sq., N.Y.
Stein-Brill Corp., 183 Varick St., N.Y.
(New & Used) See page 65.

TANKS (for Liquid Soap Dispensing Systems)

Bobrick Chemical Corp., 111-117 Garcey St.,
Los Angeles
Birghton Copper Works, 2163 Western Ave.,
Cincinnati
Clifton Chemical Co., 247 Front St., N.Y.
See page 19.
Eagle Soap Corp., Huntington, Ind.
See page 26.
Imperial Brass Mfg. Co., 1200 W. Harrison St.,
Chicago
Moore Brothers Co., 200 Hudson St., N.Y.
Palmer Prods., Inc., Waukesha, Wis.
John Trageser Steam Copper Works,
Grand Ave., Maspeth, L. I., N.Y.
U. S. Sanitary Specialties Corp.,
435 S. Western Ave., Chicago

TANKS (Steel Mixing and Storage)

Alloy Prods. Corp., 221 Madison St.,
Waukesha, Wisc.
Alsop Engineering Corp., 39 W. 60th St., N.Y.
See pages 6, 7.
Consolidated Prods. Co., 15 Park Row, N.Y.
(Used) See page 21.
J. H. Day Co., 1144 Harrison Ave., Cincinnati
Wm. Garrigue & Co., 9 S. Clinton St., Chicago
Graver Tank & Mfg. Corp., 28 E. Jackson Blvd.,
Chicago
Houchin Machinery Co., Hawthorne, N.J.
See page 37.
Huber Mach. Co., 259—46th St., Brooklyn
See page 38.
Illinois Steel Corp., 208 S. LaSalle St.,
Chicago

TANKS (Steel Mixing and Storage) (Cont'd)

Lancaster Iron Works, 564 S. Prince St.,
Lancaster, Pa.
J. M. Lehmann Co., 248 W. Broadway, N.Y.
Littleford Bros., 451 E. Pearl St., Cincinnati
Lukens Steel Corp., Coatesville, Pa.
Mixing Equipment Co., 1024 Garson Ave.,
Rochester, N.Y.

Newman Tallow & Soap Machinery Co.,
1051 W. 35th St., Chicago

See page 45.

Patterson Foundry & Machine Co.,
East Liverpool, Ohio
Petroleum Iron Works, Sharon, Pa.
Pfaudler Co., Rochester, N.Y.
Pioneer Tank & Boiler Co., Tulsa, Okla.
Stein-Brill Corp., 183 Varick St., N.Y.

(Used)

See page 65.

Struthers-Wells Co., Warren, Pa.
John Trageser Steam Copper Works,
Grand St., Maspeth, L. I., N.Y.

TANKS (Wooden Mixing and Storage)

Atlantic Tank & Barrel Co.,
North Bergen, N. J.
Consolidated Prods. Co., 15 Park Row, N.Y.

(Used)

See page 21.

J. H. Day Co., 1144 Harrison Ave., Cincinnati
General Tank Corp., 30 Church St., N.Y.
Hauser-Stander Tank Co., Ivorydale, Cinn.
Kalamazoo Tank & Silo Co.,
Kalamazoo, Mich.

Newman Tallow & Soap Machy. Co.,
1051 W. 35th St., Chicago (Used)

See page 45.

New England Tank & Tower Co.,
Everett, Mass.

Pacific Tank & Pipe Co., 334 Market St.,
San Francisco

Stein-Brill Corp., 183 Varick St., N.Y.

(Used)

See page 65.

Tippett & Wood, Phillipsburg, N. J.

TAR ACID OIL

American-British Chem. Supplies, Inc.,
180 Madison Ave., N.Y.

Baird & McGuire, Inc., Holbrook, Mass.

See pages 14, 15.

Barrett Co., 40 Rector St., N.Y.

S. H. Bell Co., Gulf Bldg., Pittsburgh

Dominion Tar & Chem. Co., Ltd.,

430, Canada Cement Bldg., Montreal,

Que., Canada

William E. Jordan & Bro., 2590 Atlantic Ave.,
Brooklyn

Koppers Prods. Co., Koppers Bldg., Pittsburgh

Merck & Co., Rahway, N.J.

Reilly Tar & Chem Co., Indianapolis

See page 56.

TAR ACIDS, High-Boiling

American-British Chem. Supplies, Inc.,

180 Madison Ave., N.Y.

Barrett Co., 40 Rector St., N.Y.

S. H. Bell Co., 1407 Gulf Bldg., Pittsburgh

Koppers Prods. Co., Koppers Bldg., Pittsburgh

Monsanto Chemical Co., St. Louis

Reilly Tar & Chem. Co., Indianapolis

See page 56.

TERPENELESS OILS (see ESSENTIAL OILS)**TERPENYL ACETATE (see AROMATIC CHEMICALS)****TERPINEOL**

(see also *Essential Oils*)

Dodge & Olcott Co., 180 Varick St., N.Y.

P. R. Dreyer Inc., 12 E. 12th St., N.Y.

Fritzsche Brothers, Inc., 76 Ninth Ave., N.Y.

Givaudan-Delawanna, Inc., 80—5th Ave., N.Y.

See inside front cover, 33.

Pfaltz & Bauer, Inc., 300 Pearl St., N.Y.

Ungerer & Co., 13 W. 20th St., N.Y.

See page facing front cover, 68.

TETRACHLORETHYLENE (see SOLVENTS, ORGANIC)**TETRALIN**

E. I. du Pont de Nemours & Co.,
Wilmington, Del.

TEXTILE SOAPS

Armour Soap Wks., 1355 W. 31st St., Chicago

See page 12.

J. O. Draper Co., Pawtucket, R. I.

J. Eavenson & Sons, Del. & Penn Sts.,

Camden, N. J.

Enterprise Mill Soap Wks., 2231 N. 12th St.,
Philadelphia

Arnold Hoffman & Co., Providence, R. I.

Iowa Soap Co., 810 Valley St., Burlington, Ia.

H. Kohnstamm & Co., 91 Park Pl., N.Y.

Laurel Soap Mfg. Co., Tioga St., Phila.

Los Angeles Soap Co., Los Angeles, Cal.

Geo. E. Marsh Co., 200 Broadway, Cambridge,
Mass.

National Oil Products Co., Harrison, N.J.

National Soap Co., 357 South 25th St.,

Tacoma, Wash.

Newell Guttradt & Co., 350 Fremont St.,
San Francisco

Procter & Gamble Co., Cincinnati

Rome Soap Mfg. Co., Rome, N.Y.

Scholler Bros., 3301 Amber St., Philadelphia

Geo. E. Sherman Co., 153 Classon Ave.,
Brooklyn, N.Y.

Swift & Co., Union Stock Yards, Chicago

Ultra Chem. Wks., Inc., Kitay Bldg.,

Paterson, N. J.

Warren Soap Mfg. Co., 51 Waverly St.,
Cambridge, Mass.

M. Werk Co., St. Bernard, Cincinnati

Jacques Wolf & Co., Passaic, N. J.

Chas. W. Young & Co., 1247 N. 26th St., Phila.

THALLIUM SULFATE (Rat Poisons)

American Fluoride Corp., 151 W. 19th St., N.Y.

Foot Mineral Co., 1606 Summer St., Phila.

Hugo Falck & Co., 25 Broadway, N.Y.

Jungmann & Co., 157 Chambers St., N.Y.

See inside back cover.

Lethelin Products Co., Manhasset, N.Y.

Ore & Chemical Corp., 40 Rector St., N.Y.

Pfaltz & Bauer, Inc., 300 Pearl St., N.Y.

THEATRE SPRAY BASES (see PETROLEUM BASES)

THEATRE SPRAY PERFUMES

van Ameringen-Haebler, Inc.,
315—4th Ave., N.Y. See pages 10, 11.
Aromatic Products, Inc., 15 E. 30th St., N.Y.
See page 13.

Ph. Chaleyser, Inc., 200 Varick St., N.Y.
Compagnie Duval, 121 E. 24th St., N.Y.
Compagnie Parento, Inc.,
Croton-on-Hudson, N.Y.
Dodge & Olcott Co., 180 Varick St., N.Y.
P. R. Dreyer Inc., 12 E. 12th St., N.Y.
A. C. Drury & Co., 219 East North Water St.,
Chicago

E. I. du Pont de Nemours & Co., Inc.,
Wilmington, Del. See page facing page 1.
Evergreen Chemical Co., 160—5th Ave., N.Y.
Felton Chemical Co., 603 Johnson Ave., Bklyn.
Fritzsche Brothers, Inc., 76 Ninth Ave., N.Y.
Givaudan-Delawanna, Inc., 80—5th Ave., N.Y.
See inside front cover, 33.

Heine & Co., 54 Cliff St., N.Y.
Pierre Lemoine, Inc., 62 Watts St., N.Y.
Geo. Lueders & Co., 427 Washington St., N.Y.
Magnus, Mabree & Reynard, 32 Cliff St., N.Y.
A. Maschmeijer, Jr., Inc., 43 W. 16th St., N.Y.
Neumann-Buslee & Wolfe, 224 W. Huron St.,
Chicago

Orbis Products Corp., 215 Pearl St., N.Y.
See page 4.

Pfaltz & Bauer, 300 Pearl St., N.Y.
Polak's Frutal Wks., Inc., 350 W. 31st St., N.Y.
Riviera Products Co., 215 W. Ohio St.,
Chicago

H. C. Ryland, Inc., 161 Water St., N.Y.
Schimmel & Co., 601 W. 26th St., N.Y.
C. A. Seguin Co., 500 N. Dearborn St., Chicago
Wm. G. Sibbach & Co., 201 S. 2nd Ave.,
Maywood, Ill.

Synfleur Scientific Labs., Monticello, N.Y.
Ungerer & Co., 13 W. 20th St., N.Y.

See page facing inside front cover, 68.
Van Dyk & Co., 57 Wilkinson Ave.,
Jersey City, N.J.

Albert Verley, Inc., 11 E. Austin Ave., Chicago
See page 69.

THEATRE SPRAYS

Antiseptol Co., 5524 Northwest Highway,
Chicago
Chemical Compounding Corp., 262 Huron St.,
Brooklyn

Chemical Supply Co., 2450 Canal Rd., Cleveland
Chicago Sanitary Prods. Co.,
2526 W. Congress St., Chicago

Churchill Mfg. Co., 309 Douglas St.,
Sioux City, Ia.

Clifton Chemical Co., 247 Front St., N.Y.
See page 19.

Eagle Soap Corp., Huntington, Ind.
See page 26.

Fuld Bros., 2308 Frederick Ave., Baltimore
See page 30.

Globe Sanitary Supply Co., 2249 E. 38th St.,
Los Angeles

James Good, Inc., Kensington, Philadelphia
See page 34.

Goulard & Olena, 140 Liberty St., N.Y.
Hockwald Chemical Co., 436 Bryant St.,
San Francisco

Hubman Supply Co., 225 N. 4th St.,
Columbus, O.

Hunt Mfg. Co., Lisbon Rd., Cleveland

Jansen Soap & Chem. Co., 324 Leavenworth St.,
San Francisco
Marshall Prods., Inc., 806 N. 1st St., St. Louis
Maywood Pest Exterminators, 1206 E. 1st Ave.,
Maywood, Ill.
Palmer Products, Inc., Waukesha, Wis.
Peck's Prods. Co.,
522-40 N. 2nd St., St. Louis
Theo. B. Robertson Prods. Co.,
700 W. Division St., Chicago
Selig Co., 336 Marietta St., Atlanta, Ga.
U. S. Sanitary Specialties Corp.,
435 S. Western Ave., Chicago
World Spray Co., Inc., 5117 Central Ave.,
Los Angeles

THERMOMETERS (see INSTRUMENTS)**THYME OIL (see ESSENTIAL OILS)****THYMOL (see AROMATIC CHEMICALS)****TIGHT WRAPPING MACHINERY (see WRAPPING MACHINERY)****TIN CRYSTALS**

American Cyanamid & Chem. Corp.,
30 Rockefeller Plaza, N.Y.
J. T. Baker Chem. Co., Phillipsburg, N. J.
General Chemical Co., 40 Rector St., N.Y.
See page 31.
Grasselli Chemical Co., 1300 Guardian Bldg.,
Cleveland See page 35.
Metal & Thermit Corp., 120 Broadway, N.Y.

TOILET GOODS (see TOILET PREPARATIONS)**TOILET GOODS COLORS**

(see also *Perfuming Compounds*)

American Aniline Prods., Inc.,
45 E. 17th St., N.Y.
Dyestuffs & Chemicals, Inc.,
11th & Monroe Sts., St. Louis
Fezandie & Sperrle, 205 Fulton St., N.Y.
Geigy Co., 89 Barclay St., N.Y.
General Dyestuffs Corp., 230—5th Ave., N.Y.
Interstate Color Co., Inc., 5 Beekman St., N.Y.
H. Kohnstamm & Co., 91 Park Place, N.Y.
Leeben Chemical Co.,
389 Washington St., N.Y.
National Aniline & Chemical Co.,
40 Rector St., N. Y.
Pylam Products Co., 799 Greenwich St., N.Y.
See page 55.

Sandoz Chemical Works,
61 Van Dam St., N.Y.
Welch, Holme & Clark Co., Inc.,
563 Greenwich St., N.Y.

TOILET PAPER

Brown Co., Portland, Me.
Hoberg Paper & Fibre Co., Green Bay, Wis.
Scott Paper Co., Chester, Pa.
Straubel Paper Co., Green Bay, Wis.
U. S. Envelope Co., Lititz, Pa.

TOILET PREPARATIONS*(see also Bath Salts, Shampoos, etc.)*

Cincinnati Soap Co.,
7th & Elm Sts., Cincinnati
Commercial Labs., Newark, N.Y. State
Lightfoot Schultz Co., 1412 Park Ave.,
Hoboken, N. J.
Geo. A. Schmidt Co., 236 W. North Ave.,
Chicago
Shores Co., Cedar Rapids, Ia.
Allen B. Wrisley Co., 6801 W. 65th St., Chicago

TOILET SOAP BASE (for CAKES)

Armour Soap Wks., 1355 W. 31st St., Chicago
See page 12.

Cincinnati Soap Co.,
7th & Elm Sts., Cincinnati
Colgate-Palmolive-Peet Co., Jersey City, N.J.
Hewitt Soap Co., Dayton, O.
Holbrook Mfg. Co., 18th St., Jersey City, N. J.
Los Angeles Soap Co., Los Angeles, Cal.
Peck's Prods. Co., 522-40 N. 2nd St., St. Louis
Procter & Gamble Co., Cincinnati
J. T. Robertson Co., Syracuse, N.Y.
Geo. A. Schmidt Co., 236 W. North Ave.,
Chicago
Swift & Co., Chicago
Allen B. Wrisley Co., 6801 W. 65th St., Chicago

TOILET SOAP MILLS (see MILLS, TOILET SOAP)**TOILET SOAPS (Cakes)**

Armour Soap Wks., 1355 W. 31st St., Chicago
See page 12.

Cincinnati Soap Co., Cincinnati
Colgate-Palmolive-Peet Co., Jersey City, N.J.
J. Eavenson & Sons, Del. & Penn Sts.,
Camden, N. J.
Hewitt Soap Co., Dayton, O.
Larkin Co., Buffalo, N.Y.
Lightfoot Schultz Co., 1412 Park Ave.,
Hoboken, N. J.
Los Angeles Soap Co., Los Angeles, Cal.
National Soap Co., Box 1613, Tacoma, Wash.
Newell, Gutradt Co., 350 Fremont St.,
San Francisco
North Coast Soap & Chem. Wks.,
Seattle, Wash.
Peck's Prods. Co., 522-40 N. 2nd St., St. Louis
Procter & Gamble, Cincinnati
J. T. Robertson Co., 147 Richmond Ave.,
Syracuse, N.Y.
Geo. A. Schmidt Co., 236 W. North Ave.,
Chicago
John T. Stanley Co., 640 W. 30th St., N.Y.
Swift & Co., Chicago
Vliet Soap Co., 638 Monroe St., Brooklyn
Warren Soap Mfg. Co., 51 Waverly St.,
Cambridge, Mass.
M. Werk Co., St. Bernard, Cincinnati
Allen B. Wrisley Co., 6801 W. 65th St., Chicago

TOOTH PASTE

Commercial Laboratories, Newark, N. Y. State
McKesson & Robbins, 79 Cliff St., N.Y.

Geo. A. Schmidt Co., 236 W. North Ave.,
Chicago
Shores Co., Cedar Rapids, Ia.
Strong Cobb & Co., Cleveland
Allen B. Wrisley Co., 6801 W. 65th St., Chicago

TOWELS, PAPER (see PAPER TOWELS)**TRICHLOROBENZENE (see SOLVENTS, ORGANIC)****TRICHLORETHYLENE (see SOLVENTS, ORGANIC)****TRIETHANOLAMINE (see ETHANOLAMINE)****TRIPOLI**

Allied Industrial Prods. Co.,
17 N. Elizabeth St., Chicago
Barnsdall Tripoli Co., Seneca, Mo.
Chas. B. Chrystal Co., 11 Park Pl., N.Y.
Goris & Arnstein, 3700 Racine Ave., Chicago
K. F. Griffiths, 110 E. 42nd St., N.Y.
Hammill & Gillespie, 225 Broadway, N.Y.
Independent Gravel Co., Joplin, Mo.
Innis, Speiden & Co., 117 Liberty St., N.Y.
See page 40.

International Silica Co., Cairo, Ill.
Natural Products Co., 307 W. 8th St.,
Los Angeles
Tamms Silica Co., 228 N. La Salle St., Chicago
Whittaker, Clark & Daniels, Inc.,
245 Front St., N.Y.
Wishnick-Tumpeier, Inc., 295 Madison Ave.,
N.Y.

TRISODIUM PHOSPHATE*(see also Brokers and Dealers)*

American Cyanamid & Chemical Corp.,
30 Rockefeller Plaza, N.Y.
Blockson Chemical Co., Joliet, Ill.
Bowker Chem. Co., 50 Church St., N.Y.
General Chemical Co., 40 Rector St., N.Y.
See page 31.
Grasselli Chemical Co., 1300 Guardian Bldg.,
Cleveland
See page 35.
Harshaw Chemical Co., 1945 E. 97th St.,
Cleveland
International Agricultural Corp.,
61 Broadway, N.Y.
Monsanto Chemical Co., 30 Rockefeller Plaza,
N.Y.
Phosphate Prods. Corp., Richmond, Va.
Victor Chemical Works,
141 W. Jackson Blvd., Chicago
Warner Chemical Co., 405 Lexington Ave., N.Y.
See page 70.

TRUCKS (Portable)

American Car & Foundry Co.,
30 Church St., N.Y.
Consolidated Prods. Co., 15 Park Row, N.Y.
(Used) See page 21.
J. H. Day Co., 1144 Harrison Ave., Cincinnati

TRUCKS (Portable) (Cont'd)

- Fairbanks, Morse & Co., 900 S. Wabash St.,
Chicago
Houchin Machinery Co., Hawthorne, N.J.
See page 37.
Huber Mach. Co., 265—46th St., Brooklyn
See page 38.
G. B. Lewis Co., Watertown, Wis.
Schwenk Safety Device Corp.,
80 Broad St., N.Y.
Stein-Brill Corp., 183 Varick St., N.Y.
(Used) See page 65.

**TUBE FILLING MACHINERY (see
FILLING MACHINERY, TUBES)****TUBES (Collapsible)**

- Aluminum Company of America,
Gulf Bldg., Pittsburgh, Pa.
Art Tube Co., Irvington, N. J.
Bond Manufacturing Co., Wilmington, Del.
Consolidated Fruit Jar Co.,
New Brunswick, N. J.
Continental Can Co., 100 E. 42nd St., N.Y.
See page 22.
Globe Collapsible Tube Corp.,
23 Columbia Heights, Bklyn., N.Y.
Hygienic Tube Co., 34 Ave. L., Newark, N.J.
(Celluloid)
National Collapsible Tube Co.,
Providence, R. I.
New England Collapsible Tube Co.,
New London, Conn.
Peerless Tube Co., Bloomfield, N. J.
Sun Tube Corp., Hillside, N. J.
Victor Metal Products Corp., Bklyn., N.Y.
White Metal Mfg. Co., 1012 Grand St.,
Hoboken, N. J.
A. H. Wirz, Inc., Chester, Pa.

TUBES, MAILING (see CANS, FIBRE)**TUBES (Transparent Celluloid)**

- Lusteroid Container Co., So. Orange, N.J.
Hygienic Tube Co., Newark, N.J.

TURPENTINE

- American Turpentine & Tar Co.,
New Orleans, La.
Antwerp Naval Stores Co., Savannah, Ga.
General Naval Stores Co.,
230 Park Ave., N.Y.
Guignon & Green, 17 Battery Pl., N.Y.
Hercules Powder Co., Wilmington, Del.
National Turpentine Pwds. Co.,
Gull Point, Fla.
Taylor, Lowenstein & Co., Mobile, Ala.
G. A. Wharry & Co., 24 State St., N.Y.

**URINAL BLOCKS (see DEODORIZING
BLOCKS)****USED MACHINERY & EQUIPMENT**

- Consolidated Products Co., 15 Park Row, N.Y.
See page 21.
First Machinery Co., 419 Lafayette St., N.Y.
Houchin Machinery Co., Hawthorne, N.J.
See page 37.
Huber Machine Co., 259—46th St., Brooklyn,
N.Y. See page 38.
J. M. Lehmann Co., 250 West Broadway, N.Y.
Machinery & Equipment Co.,
225 Sherman Ave., Newark, N. J.
Newman Tallow & Soap Machinery Co.,
1051 W. 35th St., Chicago See page 45.
Stein-Brill Corp., 183 Varick St., N.Y.
See page 65.

VACUUM CLEANERS (Heavy Duty)

- Breuer Electric Mfg. Co., 852 Blackhawk St.,
Chicago See page 17.
Fay Co., Madison Ave., N.Y.

VACUUM PUMPS (see PUMPS)**VALVES (Soap)**

- Alloy Prods. Corp., 221 Madison St.,
Waukesha, Wisc.
American Car & Foundry Co.,
30 Church St., N.Y.
Foster Pump Works, Inc., 54 Washington St.,
Brooklyn
Imperial Brass Mfg. Co., 1200 W. Harrison St.,
Chicago
Palmer Products, Waukesha, Wis.
U. S. Sanitary Specialties Corp.,
435 S. Western Ave., Chicago

VANILLIN*(see also Essential Oils)*

- Fries Bros., 90 Reade St., N.Y.
Givaudan-Delawanna, Inc., 80—5th Ave., N.Y.
See inside front cover, 33.
Maywood Chemical Co., Maywood, N.J.
Monsanto Chemical Works, 1724 S. 2nd St.,
St. Louis, Mo.
Verona Chemical Co., Verona Ave.,
Newark, N.J.

VAPORIZERS (see SPRAYERS, STEAM)**VATS (see TANKS)****VENDING MACHINES**

- Acme Cotton Products Co., 245—5th Ave., N.Y.
(Sanitary Napkin)
Brown Co., Portland, Me. (Soap and Paper
Towel)
Hospital Specialty Co., 41 Union Sq., N.Y.
(Sanitary Napkin)
Rochester Germicide Co., Rochester (Sanitary
Napkin)

VETIVERT OIL (see ESSENTIAL OILS)

VOLCANIC ASH

Allied Industrial Prods. Co.,
17 N. Elizabeth St., Chicago
Goris & Arnstein, 37th & Racine Ave., Chicago
K. F. Griffiths, 110 E. 42nd St., N.Y.
Hammill & Gillespie, 225 Broadway, N.Y.
Jas. H. Rhodes & Co., 157 W. Austin Ave.,
Chicago
Tamms Silica Co., 228 N. LaSalle St., Chicago
Whitaker, Clark & Daniels, 245 Front St., N.Y.

WASHING COMPOUNDS (see CLEANING COMPOUNDS)**WASHING MACHINERY (Bottles)**

Alsop Engineering Corp., 39 W. 60th St., N.Y.
See pages 6, 7.
Barry-Wehmiller Machinery Co.,
4660 W. Florissant Ave., St. Louis
Consolidated Prods. Co., 15 Park Row, N.Y.
(Used) See page 21.
Karl Kiefer Machine Co., Cincinnati, O.
Newman Tallow & Soap Machy. Co.,
1051 W. 35th St., Chicago (Used)
See page 45.
Stein-Brill Corp., 183 Varick St., N.Y.
(Used) See page 65.
F. J. Stokes Mach. Co., Philadelphia, Pa.
U. S. Bottlers Machinery Co.,
4025 N. Rockwell St., Chicago

WASHING MACHINERY (Drums and Barrels)

F. Aue & Co., 171 Beebe Ave.,
Long Island City, N.Y.
Consolidated Prods. Co., 15 Park Row, N.Y.
(Used) See page 21.
Eureka Machine Co., 2061 Vega Ave.,
Cleveland
Charles E. Farrington, Phoenixville, Pa.
Harnischfeger Corp., 4400 W. National Ave.,
Milwaukee
Newman Tallow & Soap Machy. Co.,
1051 W. 35th St., Chicago (Used)
See page 45.
Stein-Brill Corp., 183 Varick St., N.Y.
(Used) See page 65.
Vol-U-Meter Co., 707 Ohio St., Buffalo

WASHING POWDERS

American Soap Powder Wks.,
100 Van Dyke St., Brooklyn, N.Y.
Armour Soap Wks., 1355 W. 31st St., Chicago
See page 12.
Cary Mfg. Co., Joliet, Ill.
Columbia Soap & Chem. Co., Inc.,
324 Leavenworth St., San Francisco
Creco Co., Inc., Creco Bldg., Long Island City,
N.Y.
Du Bois Soap Co., Cincinnati, O.
Hewitt Soap Co., Dayton, O.
H. Kohnstamm & Co., 91 Park Place, N.Y.
Los Angeles Soap Co., Los Angeles, Calif.
Geo. E. Marsh Co., 200 Broadway, Cambridge,
Mass.
National Milling & Chem. Co.,
Managunk, Philadelphia, Pa.
North Coast Soap & Chem. Wks.,
Seattle, Wash.

Paper Makers Chemical Corp.,
Kalamazoo, Mich.
Peck's Prods. Co., 522-40 N. 2nd St., St. Louis
Poland Soap Works, Anniston, Ala.
Procter & Gamble Co., Cincinnati
Theo. B. Robertson Prods. Co.,
700 W. Division St., Chicago
Shores Co., Cedar Rapids, Ia.
Solvay Sales Corp., 40 Rector St., N. Y.
See pages 62, 63.
Stevens Soap Corp., 200 Sullivan St., Brooklyn
Swift & Co., Union Stock Yards, Chicago
Victor Chemical Works, 141 W. Jackson Blvd.,
Chicago
Warren Soap Mfg. Co., 51 Waverly St.,
Cambridge, Mass.

WATER SOFTENERS

Allied Industrial Prods. Co., 17 N. Elizabeth St.,
Chicago
American Cyanamid & Chem. Corp.,
30 Rockefeller Plaza, N.Y.
Cary Mfg. Co., Joliet, Ill.
Chicago Sanitary Prods. Co.,
2526 W. Congress St., Chicago
Fuld Bros. 2308 Frederick Ave., Baltimore
See page 30.
Jansen Soap & Chem. Co., 324 Leavenworth St.,
San Francisco
Kemiko Mfg. Co., 191 Murray St.,
Newark, N. J.
Permutit Co., 330 W. 42nd St., N.Y.
Procter & Gamble Co., Cincinnati
Theo. B. Robertson Prods. Co.,
700 W. Division St., Chicago
Shores Co., Cedar Rapids, Ia.
Solvay Sales Corp., 40 Rector St., N.Y.
See pages 62, 63.

WATER STILLS (Automatic)

Consolidated Prods. Co., 15 Park Row, N.Y.
(Used) See page 21.
Newman Tallow & Soap Machy. Co.,
1051 W. 35th St., Chicago (Used)
See page 45.
Stein-Brill Corp., 183 Varick St., N.Y.
(Used) See page 65.
F. J. Stokes Machine Co., Tabor Rd.,
Phila., Pa.

WAX APPLICATORS

American Standard Mfg. Co.,
2509 Lime St., Chicago
Chicago Sanitary Prods. Co.,
2526 W. Congress St., Chicago
Churchill Mfg. Co., 309 Douglas St.,
Sioux City, Ia.
Fay Co., 130 Madison Ave., N.Y.
Federal Varnish Co., 333 S. Peoria St.,
Chicago See page 28.
Franklin Research Co., 5134 Lancaster Ave.,
Phila.
Fuld Bros., 2308 Frederick Ave., Baltimore
See page 30.
Palmer Products, Inc., Waukesha, Wis.
Pioneer Mfg. Co., 3053 E. 87th St., Cleveland
Theo. B. Robertson Prods. Co.,
700 W. Division St., Chicago
H. F. Staples Co., Medford, Mass.

WAX, FLOOR, (see FLOOR WAX)**WAX POLISHES, (see POLISH, WAX)****WAXES (CARNAUBA, CANDELILLA,****MONTAN, ETC., do not confuse with floor wax)**

American Cyanamid & Chem. Corp.,

30 Rockefeller Plaza, N.Y.

E. A. Bromund Co., 256 Broadway, N.Y.

T. G. Cooper & Co., 47 N. 2nd St., Phila.

A. C. Drury & Co., 219 East North Water St., Chicago

Otto A. C. Hagen Co., 929 Ledger Bldg., Phila.

J. L. Hopkins & Co., 220 Broadway, N.Y.

Innis, Speiden & Co., 117 Liberty St., N.Y.

See page 40.

W. & A. Leaman, 17 State St., N.Y.

George H. Lincks, 123 Front St., N.Y.

Muench-Kreuzer Candle Co., Syracuse, N.Y.

Neumann-Buslee & Wolfe, 224 W. Huron St., Chicago

S. B. Penick & Co., 132 Nassau St., N.Y.

See page 47.

R. J. Prentiss & Co., 100 Gold St., N.Y.

See page 53.

Frank B. Ross Co., 79 Wall St., N.Y.

L. A. Salomon & Bro., 216 Pearl St., N.Y.

E. M. Sergeant Pulp & Chemical Co., 350—5th Ave., N.Y.

Sherwood Petroleum Co., Bush Terminal Bldg., No. 1, Brooklyn, N.Y.

Strahl & Pitsch, 141 Front St., N.Y.

Strohmeyer & Arpe, 139 Franklin St., N.Y.

Smith-Weihman Co., 15 Moore St., N.Y.

See page 61.

Will & Baumer Candle Co., Syracuse, N.Y.

WEIGHING EQUIPMENT (Automatic)**Consolidated Prods. Co., 15 Park Row, N.Y.**

(Used)

See page 21.

J. L. Ferguson Co., Joliet, Ill.

B. F. Gump Co., 431 S. Clinton St., Chicago

S. Howes Co., Silver Creek, N.Y.

Johnson Automatic Sealer Co., Ltd., Battle Creek, Mich.

Newman Tallow & Soap Machy. Co.,

1051 W. 35th St., Chicago (Used)

See page 45.

Pneumatic Scale Corp., Norfolk Downs, Mass.

See pages 48, 49.

Stein-Brill Corp., 183 Varick St., N.Y.

(Used)

See page 65.

F. J. Stokes Machine Co., Phila., Pa.

Stokes & Smith Co., 4915 Summerdale Ave., Phila.

See page 66.

Triangle Package Machinery Co.,

910 Spaulding Ave., Chicago

Volumeter Co., 710 Ohio St., Buffalo, N.Y.

WHALE OIL(see also *Brokers and Dealers*)

F. A. Marsily & Co., 15 Whitehall St., N.Y.

Murray Oil Prods Co., 21 West St., N.Y.

J. H. Redding Co., 17 Battery Pl., N.Y.

Snow & Cleaver, Inc., 15 William St., N.Y.

See page facing 3rd cover.

Wilbur-Ellis Co., 17 Battery Pl., N.Y.

See page 71.

WHALE OIL SOAPS(see also *Fish Oil Soaps*)**James Good, Inc., Kensington, Philadelphia**

See page 34.

National Oil Products Co., Harrison, N. J.

National Soap Co., Box 1613, Tacoma, Wash.

Newell, Guttrud Co., 350 Fremont St.,

San Francisco

North Coast Chemical & Soap Works, Seattle, Wash.

Peck's Prods. Co., 522-40 N. 2nd St., St. Louis

Procter & Gamble Co., Cincinnati

WHITE MINERAL OILS

A. C. Drury & Co., 219 East North Water St., Chicago

S. Schwabacher & Co., 25 Beaver St., N.Y.

Sherwood Petroleum Co., Bush Terminal Bldg., No. 1, Brooklyn, N.Y.

L. Sonneborn Sons, 88 Lexington Ave., N.Y.

See page 64.

Stanco, Inc., 2 Park Ave., N.Y.

WHITING

American Cyanamid & Chem. Corp.,

30 Rockefeller Plaza, N.Y.

Chas. B. Chrystal Co., 11 Park Pl., N.Y.

Columbia Alkali Co., 30 Rockefeller Plaza, N.Y.

See page 20.

Stanley Doggett, Inc., 75 Varick St., N.Y.

Goris & Arnstein, 37th & Racine Ave., Chicago

Grasselli Chem. Co., 1300 Guardian Bldg.,

Cleveland

See page 35.

W. S. Gray Co., 342 Madison Ave., N.Y.

Hammill & Gillespie, 225 Broadway, N.Y.

Industrial Chem. Sales Co., Inc.,

230 Park Ave., N.Y.

Innis, Speiden & Co., 117 Liberty St., N.Y.

See page 40.

Pittsburgh Plate Glass Co., Milwaukee, Wis.

Reliance Whiting Co., Alton, Ill.

George A. Rowley Co., 119 N. Broad St., Phila.

L. A. Salomon & Bro., 216 Pearl St., N.Y.

E. M. Sergeant Pulp & Chemical Co., 350—5th Ave., N.Y.

Geo. B. Smith Chem. Works, Springfield, Ill.

Wishnick-Tumpeier, Inc., 295 Madison Ave., N.Y.

WOOL GREASE

American Cyanamid & Chem. Corp.,

30 Rockefeller Plaza, N.Y.

Bopf-Whittam Corp., Westfield, N. J.

A. C. Drury & Co., 219 E. N. Water St., Chicago

Durkee Famous Foods, Inc., 2670 Elston Ave., Chicago

Hummel Chemical Co., 90 West St., N.Y.

W. L. Jacobs, Sperry Bldg., Brooklyn, N.Y.

Jungmann & Co., 157 Chambers St., N.Y.

See inside back cover.

W. L. Montgomery & Co., 89 Beach St., Boston

Pfaltz & Bauer, Inc., 300 Pearl St., N.Y.

WRAPPING MACHINERY (Cake Soaps)**Consolidated Prods. Co., 15 Park Row, N.Y.**

(Used)

See page 21.

Johnson Automatic Sealer Co., Battle Creek, Mich.

WRAPPING MACHINERY (Cake Soaps)
(Cont'd)

J. M. Lehmann Co., 250 West Broadway, N.Y.
Newman Tallow & Soap Machy. Co.,
 1051 W. 35th St., Chicago (Used)

See page 45.

Package Machinery Co., 132 Bernie Ave.,
 Springfield, Mass.

F. B. Redington Co., 112 S. Sangamon St.,
 Chicago

Stein-Brill Corp., 183 Varick St., N.Y.
 (Used)

See page 65.

Aurelio Tanzi Engineering Co., 235—4th Ave.,
 N.Y.

WRAPPING MACHINERY (Tight Wrapping)

Consolidated Prods. Co., 15 Park Row, N.Y.

(Used)

See page 21.

Newman Tallow & Soap Machy. Co.,
 1051 W. 35th St., Chicago (Used)

See page 45.

Pneumatic Scale Corp., Norfolk Downs, Mass.

See pages 48, 49.

Stein-Brill Corp., 183 Varick St., N.Y.

(Used)

See page 65.

Stokes & Smith Co., 4915 Summerdale Ave.,
 Phila.

See page 66.

WRAPPING MACHINERY (Wax)

Consolidated Prods. Co., 15 Park Row, N.Y.

(Used)

See page 21.

J. L. Ferguson Co., Joilet, Ill.

Johnson Automatic Sealer Co., Ltd.,

Battle Creek, Mich.

J. M. Lehmann Co., 250 West Broadway, N.Y.

Newman Tallow & Soap Machy. Co.,

1051 W. 35th St., Chicago (Used)

See page 45.

Package Machinery Co., 132 Bernie Ave.,
 Springfield, Mass.

Pneumatic Scale Corp., Norfolk Downs, Mass.
 Chicago

See pages 48, 49.

F. B. Redington Co., 112 S. Sangamon St.,
 Chicago

Stein-Brill Corp., 183 Varick St., N.Y.

(Used)

See page 65.

XYLENOL

Barrett Co., 40 Rector St., N.Y.

See page 16.

Koppers Products Co., Koppers Bldg.,
 Pittsburgh

Reilly Tar & Chemical Corp., Indianapolis, Ind.

See page 56.

YLANG YLANG OIL (see ESSENTIAL OILS)**ZINC OXIDE**

American Cyanamid & Chem. Corp.,
 30 Rockefeller Plaza, N.Y.

Anaconda Sales Co., E. Chicago, Ind.

J. T. Baker Chem. Co., Phillipsburg, N. J.

Chas. B. Chrystal Co., 11 Park Pl., N.Y.

A. C. Drury & Co., 219 East North Water St.,
 Chicago

Eagle-Picher Lead Co.,

134 N. La Salle St., Chicago

Grasselli Chem. Co., 1300 Guardian Bldg.,
 Cleveland

See page 35.

Harshaw Chem. Co., Cleveland

Innis, Speiden & Co., 117 Liberty St., N.Y.

See page 40.

Jungmann & Co., 157 Chambers St., N.Y.

See inside back cover.

Mallinckrodt Chemical Works, St. Louis, Mo.

Merck & Co., Rahway, N.J.

New Jersey Zinc Co., 160 Front St., N.Y.

Orbis Products Corp., 215 Pearl St., N.Y.

See page 4.

L. A. Salomon & Bro., 216 Pearl St., N. Y.

Western Zinc Oxide Co., Leadville, Col.

ZINC STEARATE (see STEARATES)

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Appendix



BLUE BOOK and CATALOG for the Soap, Insecticide, Disinfectant and Allied Industries for 1936



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NEW PRODUCTS —

A Few Hints on Their Development

By RALPH H. AUCH

Chief Chemist, Zanol Products Co.

NEW specialties are coming into the market weekly. The trade-names of some of these products ultimately will become household words and the products themselves will take their places in the laundry, the kitchen, or the medicine chest along with other "best sellers." Others with equally good or better sponsorship will languish and die with large loss of money and of sponsor's prestige, because someone has erred some place along the route from idea to finished marketable product.

But errors *do* occur even in the best regulated companies. This is evinced by the fact that one has but to ponder a moment and numerous examples come to mind. To cite only a few products,—for example, the many sided or octagon bars of laundry soap. Attractive, unusual shaped bars are quite all right in milled toilet soaps as long as they fit the hand. In a settled soap, they mean cutting, pressing and racking troubles, undue amount of scrap to be re-worked, wrapping difficulties and "deforms" in transit,—in short, a series of permanent handicaps.

The toilet cream with discolored, oily droplets on top is no fit greeting for the newly won user when she opens the jar. The oily droplets are indisputable evidence of an imperfect emulsion. The discoloration indicates that the mineral oil was of inferior quality. The former condition suggests further research, while the latter "shouts" that a more careful selection of raw materials is urgently required.

Cloudy shampoos of uninviting appearance and distasteful odor are not uncommon. Shampoos that are crystal clear even without resort to the usual glycerin, potassium carbonate, alcohol, or chilling can be made. Failing in this, a brown glass or opal glass bottle, either of which will hide the shampoo's shortcoming, may be used. Complete saponification of carefully chosen oils will eliminate the development of off-odors.

The pitfalls for new products are many. How to avoid them, and what procedure to follow in developing new items, are discussed by Mr. Auch in the light of his many years of practical experience. His advice applies equally well to reformulating and re-styling old products.

When soap beads first came out, one manufacturer put them up in a thin carton, sealed top and bottom in the usual way. If the cartons were bursted in transit, on the dealer's shelf or in the home, it made a mess and a dissatisfied user at one and the same time. Heavier carton board with all-over wrap solved the difficulty, but it took time and merchandising energy to beat down that initial ill-will or sales resistance.

The household mending cement jells in the lead tube and becomes unusable. Of course, lead tubes are cheaper than either tin or aluminum. An age test of the nitrocellulose solution in lead, in tin, and in aluminum would have proven conclusively lead's unsuitability and dictated the use of either of the other two metals.

The many highly scented health soaps merchandised in individual tuck-end cartons contaminate other things in the housewife's bag of groceries on the way home. Either glassine paper under the usual wrapper or a tight wrap cellophane would reduce the tendency to contaminate its neighbors in the journey from the factory to the home.

If any reader recognizes one of the above criticized products as his own "child," he need not feel badly. It is hoped, however, that the criticism carries sufficient weight so that he will

take steps to correct the short-coming. Lessened sales resistance and greater volume of sales will amply repay him.

Misery loves company so the writer will step out into the first person and admit the mending cement error as his own. I also admit I developed a very good tooth paste, then compounded a flavor, the dominant note of which was cassia. Why did I ignore the widely accepted mint flavor and row against, instead of with, the current? Your guess is every bit as good as mine. Many mistakes have been made and more will follow. The succeeding facts are set down in the hope that some mistakes with their attendant losses in money and prestige will be avoided.

AS STATED, the route from the initial idea to the finished product is fraught with numerous pitfalls, nearly all of which can be forestalled if reasonable care is taken with every step. In fact, the steps can and should be itemized. Usually they will number about twenty to twenty-five. Every one, even remotely connected with the development, should be provided with a copy of this list and not a single item should be struck off until all concerned are agreed that that phase of the development has been adequately covered. Obviously the list will vary with the type of product. A typical one follows:

1. Market survey.
2. Development of formula
3. Stability of formula
4. Choice and stability of odor
5. Preservative
6. Alcohol permit
7. Merit of formula
8. New raw materials required
9. Shall product be patented?
10. Conversion from test tube to manufacturing batch
11. New equipment if required
12. Type of container
13. Net contents (size)
14. Trade-name and trade-mark
15. Is product properly dressed?
16. Directions for use
17. Copy-uses and promotional
18. One or more than one size
19. Shall bid for dime store business be made?
20. Costs
21. Retail price
22. Trade and jobbing discounts
23. Size of shipping container
24. Shall a separate company be formed to exploit the specialty?

Each item in the above list will be discussed. A few will receive but scant attention because each new product presents such an individual problem that few generalities can be drawn. Or, the procedure is obvious,—open and shut. Others will be discussed in considerable detail, either because they have proven to be stumbling blocks or on account of their relatively greater importance.

The amount of time, money and energy that can be poured profitably into the development of a new product or the revamping of an old established one varies between wide limits. At the lower extreme is the manufacturer of limited capital, making an all-embracing line of say 20, 50 or 100 items, who adds another. The addition may be made to round out his line, to catch a passing fad, to capitalize one competitor's intensive merchandising, to duplicate another competitor's product (that may turn out to be a "dud") or to take a flyer. It can be done with a certain amount of abandon with some short cuts made and some chances taken.

If it proves to be a success, it will at best add only a relatively small volume. If it proves the exception and really "goes to town," the manufacturer can go back and pick up the loose ends. If it "flops," it will be allowed to fall into the discard. The worst that can happen is a few complaints from the retail outlets when the demand approaches the vanishing point.

The upper extreme is the merchandising manufacturer, producing one, two or a few specialties, who develops and adds a new product. It may be something entirely new, maybe something that is a logical companion product for those products he is already marketing, or maybe a marked improvement over competing items. In either case, much money will be spent in sales and advertising effort. His very business life may be at stake. If the product proves a success, it may in time outstrip the manufacturer's other products in volume of sales and even go so far, particularly if it be a companion or closely related product, as to stimulate the sales of the other established specialties.

On the other hand, if it proves a failure for any reason whatsoever, dire effects may follow. It will cause a large loss of money. It may cause many dealers to insist upon replacement of their stocks with the manufacturer's other more salable products. It may even cause its sponsor's good name to be injured irreparably among the retailers if not among the consumers themselves.

Such a manufacturer, who is an intensive merchandiser, can afford to leave no stone unturned, leave no detail to chance in making the product, the package and the merchandising plan as near 100 per cent as is humanly possible. In fact, he may organize a separate company to exploit the new specialty.

Now all this seems perfectly obvious, but large sums, literally fortunes, have been poured into products which have ultimately failed, too often due to lack of thorough preparation. Some were whipped even before they started. Some had to be revamped in formula, package or name, and sometimes more than once, before they became even mediocre successes.

The Market Survey

THE contemplated new product will fall into one of three classes: (a) A new and original product; (b) A competitive commonplace item is lifted into the realm of specialties by special formulation and/or improvement; (c) A product to compete with existing products, which must win its place by price concession, by sheer weight of advertising and merchandising or by being tied to a good established trade-mark or corporate name.

If the contemplated product is new and original, a preliminary survey among dealers and consumers will uncover much information of value along with determining whether or not a need actually exists for it. Creating a demand is in reality satisfying an existing need. If a definite need is lacking, no amount of creative or developmental work, careful package selection, and subsequent sales and advertising effort will obtain and sustain sales. On the other hand, if the product fills a definite previously unfilled need, it may succeed even in spite of some shortcomings.

The case of specialties, whether soap, food or toilet requisite, being given a new twist to lift them out of the commonplace, will not be discussed. To discuss them profitably would require reference to each by brand name. It would appear, however, that this field does offer greatest opportunity for development.

If a product to be developed is similar to existing products already on the market, a preliminary survey may show that there are sound objections to all of them. In the event that objections are uncovered, it would appear that to offer just another brand would prove unwise unless the objectionable features are met and overcome. Many cases come to mind but only one example will be discussed. An underarm deodorant was contemplated by a prominent manufacturer. The preliminary survey disclosed that liquid deodorants were quite effective both as deodorants and perspiration correctives. However, many users disliked the slow drying properties, especially since waiting so long for them to dry came at bedtime. Others did not like to "have to use it last night" that is, make an application one night to obtain relief the following day and evening. Still others claimed the application of a liquid caused itching or even irritation and "tendering" of their clothing.

All the creams available had a greasy base and this proved to be the chief objection to them. Some persons, however, had discontinued use because they were disappointed in their effectiveness. It was found that this type was more popular among colored than white women, although the latter class did employ the creams to some extent for use on their sanitary napkins. The deodorant powders were, according to the

survey, not without objections also. The leading objection, or criticism of this type was the difficulty of applying them where wanted, their tendency to dust and their lack of effectiveness.

With this mass of data the outlook was not any too promising. It was finally decided that a deodorant cream of the vanishing cream type would encounter the least sales resistance and had the added advantage of being altogether new. It was developed, the objections were met, it was attractively packaged, aggressively merchandised and became a success in spite of the fact that the deodorant market is a relatively thin one. Surveys on various other products have proven equally interesting from face powder through hand soap and foot powder to upholstery cleaner, fly spray and toilet soap.

Consumer research then tells what the buyers want and their objections to existing product. Consumer engineering produces articles consumers do not *know* they want but will want and buy if created for them.

This writer has been credited by an English author with being the "daddy" of liquid nail polish, credited or accused in fact of having "taught the American woman to varnish her nails." When liquid nail polish was first developed, it had its faults, such as peeling, developing a yellowish cast on the nails and becoming entirely too viscous or thick for convenient and uniform application. It was not until large numbers of chemists became interested in similar lacquers for use on automobiles, furniture and the like, that suitable nitrocellulose solvents and solutions became available and permitted liquid nail polish to attain its present satisfactory state. The prediction has been made that unless liquid floor waxes generally are materially improved, the market for them will be pretty largely killed. A limited consumer survey confirms this.

Development of Formula

THE organization maintaining its own chemical laboratory is in position to develop new products of merit and to do it with dispatch. The organization that depends on experienced practical men may expect equally good results, perhaps, but generally the product requires a longer time for its development owing to the method employed, namely "cut and try." Usually too, the product is a close duplication of an already existing product in composition and appearance which may or may not be a good thing in any individual case.

The manufacturer depending upon an outside consulting laboratory for the developmental work will do well to choose one that makes a specialty of just such work. This is because work of this kind is markedly different from the ordinary run of consulting and analytical chemical work.

Whether a product is old or new, there is no doubt that the appearance of the package in which it is sold is a very important factor controlling sales. It is much more satisfactory, of course to select a satisfactory package ahead of time, rather than have to change after an old package has become familiar.



Usually, any consultant catering to general practice can complete the work in the laboratory. When the analysis is finished or the reaction has gone to completion and the end products are identified, he has the information that he and his client sought. In this developmental work under discussion, practical tests by people outside the laboratory must be depended upon to evaluate the formula resulting from any research work. The chemist, whether he be employee or consultant should have good training and take a theoretical and academic view of his work, yet be "tainted" sufficiently with commercialism to have a practical slant at his problems.

With these qualities he is able to theorize so as to get at the bottom of things and at the same time choose that method of procedure offering most promise of financial reward for his client or employer. Summing up, he should be an optimist so that in every undertaking and problem, he sees the probable ways to success quicker than he recognizes the possible grounds for failure.

Check-Up of Competitive Products

BEFORE starting the actual developmental work, it is well to purchase all commercial products of similar nature or those prepared for the same purpose. Practical tests under the conditions of use will separate the "sheep from the goats." Singularly enough the most meritorious product may not be among the best known or largest sellers. Frequently, the best product may be little known and enjoy at best

a limited, sectional demand. This has recently proven true in the case of an auto polish, upholstery cleaner and nail polish powder. The best products may then be analyzed to ascertain the composition and identify the ingredients that others have found most suitable. It is in the little known product that the unique and unusual but efficacious ingredient is most likely to be found. The big fellow is frequently reluctant to step off the beaten path and to pioneer.

Occasionally the question arises after development of a new product, "Shall it be patented?" Almost invariably the best and safest answer is, "No!" A recent trade journal headline inadvertently, but aptly put it, "Latherless Shaving Cream Composition Revealed by Patent." The formula was published in the body of the news item and any interested competitor was free to modify the formula to evade the patent. Or the competitor could use it boldly and take the chance of being caught, and if caught, have another chance to prove the patent invalid anyway.

If the formula is held a secret, a march can be stolen on competition and the product can slip onto the market and be well on the way toward wide distribution before competition is aware of what is going on. And the first in the field always has the edge on competition and can become firmly entrenched before the onslaught of competitive items begins.

Stability of Formula

That a formula must be stable is obvious, yet even among nationally advertised prod-

ucts, those may be found lacking this attribute. Shaving creams and brushless shaving creams have been observed either too thick or too thin. They have been observed to lack smoothness. On examination little lumps have been found to be stearic acid, indicating that either the initial mixing temperature is too low or else the agitation is not vigorous enough or continued long enough. A deodorant that is essentially aluminum chloride, clouds and a precipitate forms in the bottom of the bottle. This is due to the alkalinity of the glass forming aluminum hydroxide or aluminum oxychloride or both. As little as 3/100ths of 1% of free hydrochloric acid would prevent it.

Tooth paste hardens in the tube,—perhaps due to double decomposition of the soap and the chalk. Bay rum is cloudy, having been made in an iron tank. The fancy bar of toilet soap fades or discolors,—but why continue and possibly tread on someone's toes or cause someone's face to turn as red as last year's nail polish?

There is no substitute for the age test, although the test on some product can be accelerated with proper equipment. Some gauge of the effect of age can be obtained by maintaining some of this product in the containers in which it is to be marketed, for a period of weeks in a refrigerator and in a warming chamber maintained at 110-120° F. Samples of the product may be incubated at body temperature (98-99° F.) in an electric oven for a period of days or for as long as the available time permits to observe any fermentation, separation, molding or rancidity that may take place.

Any product susceptible to freezing may be chilled in an ice and salt bath to the point where there is visible evidence of freezing. If on gradually warming to room temperature there is any untoward effect on the product, precautions in shipment necessary in cold weather or to cold climates, can be gauged.

Choice of Odor

EVERYONE has his own ideas as to perfume, but a few comments may not be amiss. The small fellow is perhaps safest if he trails the procession and puts lilac in his shaving soap, rose in his toilet cream, benzaldehyde in his massage cream, peppermint in his tooth paste, wintergreen or cedar in his insecticide, and so on. Or he may, if he elects, put a duplication or close approximation of a leader's odor in a similar or competitive product. The big fellow may want to do some pioneering. He may step off the beaten path with a new and different odor, something out of the ordinary.

Large or small, if he manufactures a line of products and develops a new one, it is usually smart to incorporate the same odor that the rest

of his line carries. Thus, the new-comer in the line becomes a member of the family and is immediately identified as such.

That an odor must be stable is as obvious as the above, yet some are quite fugitive. Ten nationally advertised face powders were held for a protracted period and only one retained its odor satisfactorily. Three held fairly well, three developed a characteristic earthy odor and the other two smelled largely of the gummy or resinous fixatives. As for soap, if the interval between kettle or amalgamator and the bath-tub is too long, many a manufacturer becomes sheepish about acknowledging the soap as his own.

The most common fault is over-perfuming. Milady who dabs on an exquisite, costly perfume as the completion of her toilette is not so keen about the hang-over odor from her soap, or her dusting powder, make-up, or moth cake, for that matter.

Often the use of a preservative or an antioxidant is indicated. If so, one should not be chosen and then await the outcome. Every possible preservative should be incorporated in separate portions of the product with the blank product for control. Then if one or more fails to work, one or another may perform its function. Usually it is well to incorporate a range of concentration in separate portions, especially if it is costly or if an excessive amount may exert an untoward effect.

In those cases where a government alcohol permit is required delay is liable to occur, in fact, is almost inevitable. Application should be made as early as possible because this is one place where the manufacturer cannot beat the gun.

A procedure that is workable is this: As soon as any formulae show promise, application for permit for each can be made. One does not have to use all the formulae after permits are granted and only that formula finally decided upon will go into production. Thus the delay that would occur if the application were not made until the formula is finally and definitely decided upon, is avoided.

Testing the Formula

THE importance of the practical testing cannot be overestimated. Unless use is made of testers outside the organization, the final choice is liable to be one which gratifies the wishes or whims of a dominating personality within the organization. Since the human element enters into this, it is possible to develop some generalities which should prove helpful. Those who are to do the practical testing must be carefully selected. Friends and employees when used for testing are generally worse than none. Friends are inclined to be agreeable and

to flatter while employees are often inclined not to express their honest opinion, especially if unfavorable, for fear of offending and falling into disfavor.

The testing should be done by a large group, particularly if the product contains active ingredients such as are to be found in a depilatory or freckle cream for example. This is because occasionally an individual may be encountered with an idiosyncrasy or allergy for one of the ingredients. Thus if the test is of a limited scope it may so happen that not a single individual with such an idiosyncrasy will be included in the test. Where it is necessary to develop and test a new seasonal product out of season, it is imperative that a connection be established with a group of testers residing in the climate which at the moment is suited to the work at hand.

Among those who have been found to be accurate and reliable as well as interested testers may be included:

- A—Members of the sales and advertising classes and of the chemistry classes of universities.
- B—The office employees of advertising agencies, or the employees of an intimate friend who will bear down and follow through.
- C—The enthusiastic users of the manufacturer's other established products.

The testers at present used by this writer and his employers comprise two groups:

- A—A small group of housewives and mothers who are graduates in dietetics and household administration, and who are paid a fee for each test.
- B—A geographically scattered group, numbering several hundred, who represent a good cross section of the American public. A few are colored people. A few are the "upper crust" whose social secretary reports the findings of the cook, the housekeeper or the laundress, while the majority are average citizens in the middle strata.

Any product must receive a favorable report from group A, the intelligentsia, before it is submitted to group B. If any product gets an unfavorable reaction, it is reformulated again and still again if necessary until it meets a favorable reception. It is then submitted to group B to confirm group A's conclusions. In other words, it is submitted to the mass as well as the class.

The Use of Questionnaires

ADVERTISING men generally have a mania for questionnaires and much has been written by them on their preparation, their application and their value. Questionnaires drafted by them are usually for the purpose of determining the consumers' preferences, buying habits, brand preferences, likes and dislikes, etc. Whether they swear at or swear by the questionnaire, the fact remains that in developing a new product, carefully drawn questionnaires are just about indispensable. There is

not much likelihood of gross inaccuracies creeping in as sometimes happens to the advertising men's results. For instance, a midwestern newspaper conducted a house to house survey to gather data for national advertisers, in which about 97 per cent of those questioned stated their preference in tooth pastes and tooth brushes. It is doubtful whether more than 40 per cent actually use either or both regularly and the remaining ones,—the big majority,—were ashamed to admit their neglect, so merely mentioned the brand name that first came to mind.

Questionnaires to accompany samples prepared for testing should be drafted so as not to influence the answers. For example, the question "What do you think of the consistency?" is obviously better than "Don't you think the consistency is satisfactory?" The latter question has an affirmative suggestion and that doubtless tends to warp the response. In other words, leading questions which tend to prejudice the answer should be avoided.

Whenever possible the question should be definite and specific so that a clean-cut definite answer will be obtained,—one from which a conclusion can be drawn. In those cases where the product is not new and must go out and compete and find its place among products that are established and favorably known on the market, it is well to insert questions that will obtain the users' spontaneous replies on the merits and inherent faults of their favorite brand. At the same time, if possible, questions should be inserted that will cast some light on how the samples in the test compare with the tester's favorite. Frequently this procedure is followed:

All competing items are purchased and tried out practically to ascertain which one most nearly meets the need and has the fewest inherent faults. This product is then bought in quantity and transferred to plain containers. The formula of the product to be tested is then made up and put in similar containers and the two are marked A and B. They are then sent out with a carefully prepared questionnaire for the devil to catch the hindmost. If a product under test comes out overwhelmingly on top, fine! If not, research is again started to overcome the objections and shortcomings uncovered by the colated questionnaires. The improved formula is then submitted to further similar testing.

To stimulate and hold the interest of testers and insure the return of the questionnaires fully and carefully filled out, some incentive must be offered. One that has given fair to good results is the offer to send a full size package of one of the manufacturer's other regularly marketed products gratis upon receipt of the filled-in questionnaire. A follow-up letter to jog their memories has also proven helpful sometimes.

New Raw Materials Required

WHEN a new specialty is developed, new raw materials are often required. As soon as it is established that there is likelihood of any given material being utilized, it is well to start shopping for it. In this way, time can be saved, and payment of premium prices for any material during the period while the logical, most economical source of supply is being lined up, can be avoided.

In other words, the shopping and the process of elimination of the unsuitable can be going on concurrently with the final developmental work. It has long been this writer's practice never to use the usual laboratory reagents and materials in developmental work, but to use commercially available materials from the very start of the research.

Sometimes when materials in a desired physical state are not available, the co-operation of manufacturers or vendors can be enlisted early. Recently a salt available only in crystals of several sizes was required in flake form. Two manufacturers were finally able to produce a satisfactory material in the desired physical state. Contracts were entered into with both so that neither was left high and dry, and both may be counted upon to co-operate on any special work in the future.

Another satisfactory arrangement is that of lining up two or more sources of supply on every raw material. If a contract is entered into with one, the second and the third one can be turned to if the first falls down on quality, on delivery or becomes financially weakened. If no contracts are entered into, the purchasing department is free to favor that vendor with the sharest pencil each time there is a requisition for procurement.

Shall the Product Be Patented?

WHEN a new, unique product is developed the question frequently arises,—shall it be patented? Almost without exception the answer is,—it should *not* be. Perusal of recent patents on specialties discloses many absurdities. Simple mixtures, often in use for decades by others, have been granted patents. The rush to the patent office by the ignorant and the uninformed is to be expected, but when national advertisers patent simple laundry mixtures, furniture polishes and the like, the explanation is difficult to find.

As stated earlier, a recent trade journal headline read "Latherless Shaving Cream Composition Revealed By Patent." Then in the text, sure enough, the formula was disclosed. A patent does disclose the formula and even the *modus operandi* and makes it available for use as is or for improvement by competition. How much better to keep the new product and its formula

dark so as to storm the market and get firmly entrenched before competition has awakened to what it is all about.

A process or a container when unique or different, or which offers some advantage to the manufacturer or to the consumer, however, should by all means be protected via the patent route. The chances of infringement are more remote and any infringements can be more satisfactorily prosecuted.

One thing to bear in mind, if an article is patented, is that trade-mark protection should be secured first. A trade-mark on an unpatented specialty may be enjoyed for the life of the business or, theoretically, until eternity. A trade-mark monopoly secured on an already patented specialty expires with the expiration of the patent monopoly after seventeen years.

Almost without exception, the trade-mark is far more valuable than the patent. Not a single product patent worth a million comes to mind whereas hundreds of trade-marks could be named each of whose value runs into millions.

From Test Tube to Plant

TAKING a new product from the laboratory test tube to the manufacturing department batch is a big step. This industry does not permit or warrant the semi-works method of installing special small equipment to prove laboratory results before going into plant scale production as does basic chemical manufacture. However, it is frequently possible to make a relatively small quantity to confirm the consistency, working temperatures, color, odor, etc., by making trial batches as small as can be handled in the equipment at hand.

If the experimental laboratory batches are 100 grams and the manufacturing batch is say 1,000 pounds, some adjustment must be necessary be made. One thousand pounds is 453,000 grams, so any laboratory errors are multiplied over 4,500 times when the product goes into production. The first to show up are those in the color and odor. An over-tinted or over-perfumed lot of any product is an abomination that has to be worked up gradually in subsequent batches. A workable procedure is to add in the first manufactured batch only one-half or two-thirds of the calculated amounts of color and odor. One can then add sparing amounts of the remainder until the correct concentration of each is obtained.

Frequently available equipment can be utilized to manufacture, fill and package a new specialty. When it is necessary to install new equipment, it is well to bear in mind that the mere fact that a competitor uses such equipment is no criterion as to its suitability. Unless one is taken behind the scenes it is a gamble whether or not the competitor's equipment is well or



Possibility of size exaggeration is an important factor in selecting the shape of your container. An oblong or oval shape gives the buyer the impression that he is getting more for his money than in a cylindrical package. Display possibilities are much better, too.

ill-suited for the work at hand and whether or not it has long since become obsolete. Machinery, however, has often been adapted or adopted from the rubber, paint, canning, chocolate and confectionery, milling and baking, dairy and beverage industries for the manufacture of specialties with entire satisfaction.

Generally, the management will do well to leave second-hand machinery alone except that which has been completely re-built. The larger manufacturer who maintains his own mechanical or repair department can go in for used equipment to a larger extent than the small manufacturer who must have all repairs and rebuilding done on the outside. Even so, there is the matter of obsolescence. Perhaps the available used equipment was thrown out by some aggressive competitor in favor of more modern, more suitable, more economical equipment.

Selection of Container

THE right type of container can be a great help in stimulating sales, and conversely, an ill chosen container can retard sales materially. As one container manufacturer very aptly advertised, "Some products seem shelf bound. Others just happen to sell. Still others have quick turnover manufactured into them and are made to sell still faster by the choice of exactly the right package."

There is no known yardstick by which the sales value of a container can be accurately measured. However, the number of products that come into the market in one container only to be subsequently changed not only once, but occasionally a second and even a third time,

indicates that a little more care in their selection in the first place would have been well directed.

Earlier it was stated that the size of the container should be determined, with rare exceptions, not by the cost of a little more or less bulk of contents, but by the number of applications it is desired to give per package. It follows then that every effort should be made to exaggerate the package size without resorting to out and out deception, such as putting a false bottom in a face powder box.

The commonly used containers are listed in descending order with regard to the degree to which they may be exaggerated, an opal glass jar, an opal glass bottle, a flint glass bottle, a flint glass jar, a jar made of plastic material, a paper box, a tin can, and a collapsible tube.

In choosing an opal jar, the first thing to avoid is the styles or shapes usually associated with prescriptions and with salves and ointments. This applies in a lesser degree when the choice is to be made between flint glass jars. Various samples, when placed side by side, after being filled with the product, render it easy to determine which of them looks the largest and is most pleasing in appearance.

Samples of different bottles in the desired capacity on being filled with the liquid they are to contain makes a choice easy. If the largest appearing bottle is not entirely pleasing to the eye, a new wood or paraffin mold can be made along similar lines which is pleasing in appearance. The present tendency toward simple cylindrical containers is a pleasing relief from the gaudy intricate shapes so long in vogue. They appeal particularly to the "upper crust"

who do not have to take size into account. And what manufacturer does not take pride in the fact that his products are favored by the wealthy ladies who live in the best suburbs and make up the social register? Of course, this patronage is flattering, but this class unfortunately is both small and fickle. A manufacturer may feel it is a reflection on his package if it appeals to the girls in the shops and offices and who live in the hall rooms and cheaper neighborhoods. However, the money of this class is as good as anybody's, and this class makes up the overwhelming majority of his potential consumers.

Next to a sphere, a cylinder looks the smallest for its cubical contents and so does not lend itself to size exaggeration. For this reason, it is likely that plain simple shapes may soon be abandoned again.

Boxes for face powder and other dry materials, in different shapes, but having the same capacity, can be assembled to choose the one that is seemingly the largest. As stated earlier, a false bottom should not be resorted to because the deception is observed by the user at the worst possible time, namely, at or about the time she is ready to purchase a new box. Padded tops on flat shallow boxes on which they look well also help to increase the apparent size and at the same time, by their softness to the touch may suggest that the contents is soft, velvety, and smooth.

Due to limitations in practical tin can manufacture, it is well to enlist the help of the can companies, when a metal can is used. Collapsible tubes continue to gain favor even though resort cannot be made to thick walls or unique or odd shapes in the endeavor to increase the apparent size or beautify the package. About the best that can be done is to take tubes of different diameters, then cut them off to the length which gives them the same capacity. When they have been stuffed with cotton or a paste and the end closed, a choice can be made.

It will be found that by changing even the shape and diameter of the cap on the chosen size tube it will look larger and more pleasing in appearance. The colors, as well as the design, of the decoration are not without their effect on the apparent size. Lengthwise stripes make the tube look smaller in diameter, annular rings increase the apparent diameter, and keeping the trade-mark directions and decorations well up to the head of the tube, with the plain body color extending well up from the lower end, tend to make the tube look longer.

What Type Container?

WHEN a product which is to be packaged, can be offered in either of two types of containers, it may prove helpful to set down the advantages of each and weigh them, one against

the other. For example, the manufacturer of a well-known shaving cream brought the product out in a jar and offered it only in this container for a long time. Finally, admitting his error, he offered it in a tube as well, and by way of introduction, staged a national contest on the relative popularity.

Even though the jar was much the tube's senior on the market, and doubtlessly many who bought the jar did so from force of habit, or did not even know the shaving cream was available in a tube,—“the tube just nosed out the jar in sales.” The published sales figures were (believe it or not) 1,338,536 tubes against 1,328,827 for the jars. And the maker continues to market both the jar and the tube.

Possibly if they had set down the merits of each, side by side, and weighed them, the shaving cream might have made its original debut in a tube. Had they done this, the comparison probably would have been along the following lines:

- | <i>Tube</i> | <i>Jar</i> |
|--|--|
| 1. Not necessary to form new buying habit because it is the prevalent type on the market. | 1. Much easier to exaggerate the size of container. |
| 2. Must be specially made and price fluctuates widely with the tin metal market. | 2. Unless a private mold is chosen, jars are available from stock in any quantity at any time. |
| 3. No label or labeling operation required. | 3. Not linked with a definite price, so any reasonable price can be fixed. |
| 4. Lighter weight per gross so cheaper shipping container of light construction can be used. Carriage charges are lower. | 4. Equally as pleasing to the eye when almost used up as when new and full. |
| 5. No breakage. Comparatively small loss due to damage in handling or transit. | |
| 6. More convenient for travelers. | |

If the type of container contemplated is different than the one generally used for competing products, as in the case above, the following question should be satisfactorily answered before the final choice is made. Which is the greater, the sales impetus given the product by the more pleasing or more convenient container, or the sales resistance offered by this dissimilarity?

Another important question is—can a sample size be produced that approximates the full size container in appearance, or that is a replica of it? Only in this way can full advantage be taken of the sales impetus this gives the product by reason of it impressing the appearance of the regular size on the recipients of the samples.

The production man should sit in when the final choice is made. It is he who comes in for criticism aplenty, when the new item is put into

production if the packaging costs are excessive, if breakage in process or in transit is unusually high, or if leakage, drying out, or dusting occurs. It is he alone who can suggest a minor change in shape or dimension so that a filling, labeling, cartoning, or other machine already available can be utilized, instead of requiring the purchase and installation of a new one.

All these things should be given due consideration so they may serve as guides to an intelligent, and a not to be regretted and subsequently changed, choice. And in the last analysis, the container must, above all, be practical. If it is to contain a powder, it must not dust; if it is to contain anything that will spill when overturned, it must rest firmly on its bottom; if it is to contain a liquid, it must not leak; and if it is to contain a product that dries out or deteriorates on continued exposure, it must reseal readily and securely.

The increased speed of trains and jolting of inter-city door to door trucks requires that containers and shipping containers as well, stand up under constantly harder usage in transit. Costly inventories of display containers have been disposed of as waste paper and a fresh attempt made because they wouldn't stand the gaff—from manufacturer, to jobber, to dealer.

On the other hand, manufacturers are sometimes too obstinate to admit their error in packaging and won't do something about it. The extent to which their good will suffers as a result thereof is lamentable.

Size of Container

THE size of the container should be determined, with rare exceptions, not by the cost of the ingredients entering into the formula of the product, but by the number of applications it is desired to give per package. Otherwise, why put liquid nail polish for the manicure in $\frac{1}{4}$ or $\frac{1}{2}$ ounce bottles and lacquer of very similar composition in pint and quart cans for the home tinker? Or, closer home, four to six ounces is the usual size shampoo for the individual and quarts and gallons for the beauty operator.

The cost of a little more or less bulk is so relatively small that the size should be one which brings the consumer back for the next package as soon as the manufacturer concludes that he desires or dares to bring him or her back.

Several methods of determining the correct sizes are workable. The simplest way, where time permits, is to supply the contemplated size to the group of testers with a request on the questionnaire to state how long the package lasts or the number of applications obtained.

A way that involves no waiting until the package is consumed is to weigh a package accurately and have different individuals withdraw the

quantity each would normally use per application. The difference in the weight of the package divided by the number of users gives the average quantity consumed per application. This figure divided into the net contents of the contemplated size container gives the average number of applications. Taking the average number of applications and the average frequency with which it will likely be used, the length of time the package will last may be gauged.

If manufacturers generally followed this simple procedure, they would frequently make their containers larger or smaller than the commercial packages in general use, instead of being guided by competition. In fact, to cite examples, brushless shaves and cleansing creams would unquestionably be larger, while under-arm deodorants and silver creams would be smaller.

However, draw conclusions slowly and only after wide tests, as some individuals instinctively use a preparation quite sparingly, while others are very wasteful regardless of whether they are paying for any product in question or not.

Fill That Container!

WHATEVER size container is finally chosen *fill it*. To the manufacturer slack filling a jar, a tube, a can, or a carton it means perhaps a fraction of an ounce; a small fraction of a penny. To the average consumer it means being short changed, cheated or something. Whatever that something is it is an unfavorable reaction, just so much sales resistance to the purchase of the next package.

No detail should be overlooked. For example, if the container is a collapsible tube look to the aperture size. A large aperture encourages freer use—brings the consumer back sooner. Accurate measurement of the ribbon, triangular and round apertures of sixteen brands of tooth paste showed openings varying from 9.5 to 45 square millimeters, in cross section. And one maker puts a 10 square millimeter opening in his small size and a 24 square millimeter in his large size. Who and which is right?

Line up commercial shaving creams, show creams, toilet creams, back off the cap and look in the business end. It will be a revelation. The plain shaving cream of one manufacturer carries a larger opening than his mentholated one. Is it worthy of consideration? A mere detail admittedly, but not an inconsequential one. These are typical of the oversights in the items named.

Trade-Name and Trade-Mark

The importance of a wise choice of both trade-name and trade-mark cannot be over emphasized. The trade-name chosen should be

easy to spell, easy to pronounce, easy to remember and hard to confuse with competing products.

Unfortunately, the discussion that follows requires that the "horrible examples" cited have to be referred to by name since generalities would carry little weight. Needless to say they are not cited to cause offense but to emphasize this very important point. "Baume Bengue Analgesic Balm" was on the market many years before it was changed to the more sensible "Balm Ben-Gay."

"Brownatone" is a widely distributed hair coloring. The name is okay for the formerly brown-haired prospects to restore their graying locks. What is the reaction however of any woman who wants to restore her gray crowning glory to its original black or titian or blonde shade? It is reasonable to conclude that the same product with a better name would enjoy greater consumer acceptance.

"Molle" the brushless shaving cream sees fit to bracket "Mo-Lay" directly under its trade-name. Since either word is after all a coined one and becomes only what the merchandiser makes it anyway, why not call it Mo-Lay in the first place? "Lather Kreem," "Barbasol" and "Burma-Shave" with suggestive, easy-to-pronounce and hard-to-muff names, labor under no such handicap.

"Kutol" wall paper cleaner hurried to put "pronounced Cut-All" under its trade-name. A similar case is "Vauv"—the cream for shiny nose. This word was coined by putting "V" before and after the two first letters of the writer's surname. It was not long until like Molle it was necessary to bracket "Vove" under the trade-name to insure correct pronunciation. Easy and correct pronunciation is imperative, for without it the buying public is hesitant about asking for a product in busy retail outlets.

"Pond's Extract Company's Cold Cream" and their vanishing cream have been aggressively merchandised for years and have won acceptance in spite of the two possessives in the name. It would appear that "Extract Company's" is confusing extra baggage. The consuming public was a house divided on the correct pronunciation "Pebeco," "Kolynos" and "Ipana" until the radio announcer with his faultless enunciation and pronunciation stepped into the breach and by countless repetitions of the names got them over to some extent. "Drift" came out under excellent sponsorship only to be changed subsequently to "Dreft." Likewise, Vick's Nose and Throat Drops was changed to "Va-tro-nol." Earlier "Lux in Toilet Form" was equally quick to change to "Lux Toilet Soap."

The expense of such changes might easily run into six figures, while the confusion and sales resistance on the part of the consumer cannot be

estimated. Literally scores of other cases might be cited but it is hoped the above will throw its scare and make anyone, in the throes of making a choice, doubly wary.

Trade-Mark Important

THE trade-mark should be selected with equal care. The girl on the "Danderine" bottle is a bit out-moded. The Smith Brothers hirsute growth today is as unbecoming as is Mr. Woodbury's or Mr. Mennen's handle-bar moustache. Dr. Sloan is not groomed 1935 and looks rather seedy as he beams from his liniment bottle. Dr. Lyon's girl friend's hair needs brushing, but she isn't likely to sell much tooth powder for him whether her hair is groomed or unkempt.

And so on and on. But to sum up, faces and figures had best be left in the family album and not put on containers, cartons and wrappers. The attire that makes 'em turn to look today makes 'em raise their eyebrows to-morrow. The trade-mark should be simple in design, devoid of script and Old English lettering, for example, so that a logotype will reproduce clearly on the commonest carton board and cheapest newsprint. Here again it is necessary to call a halt otherwise one would again go on and on.

After the decision is finally made it should be checked for conflict with any registered trade-mark. Someone in Petoskey or Paducah might be using that "carefully chosen clever name" lo these many years. He is usually shrewd enough not to bob up and assert his rights until the aggressive company that has adopted the trade-mark is in too deep to back out. Results! Either money passes hands, litigation gets it, or at least the party of the second part has the jitters for a protracted period until his path is clear again.

Is The Product Properly Dressed?

NO ONE outside the know can say whether "Camay" is satisfied with its third packaging attempt, or whether it will have still another new dress soon. Anyway, far too many products come to market all dressed up only to be subsequently changed. What a pity! The package not only serves as a practical, convenient container for the product, but it can be made to provide a means for remembering the product and remembering it favorably (or unfavorably). It can be made to tie in beautifully with the manufacturer's other packages. Then, of course, like an ugly step-child, it can be and is only too frequently developed with an utter disregard for other members of the family, i.e., other products in the line, or those that may come in the future.

A number of products have become nationally and even internationally popular without being fully dressed. That is to say, they are not enclosed in individual cartons. Talcum bottles



The family idea in package design is usually safe and effective. Here we have three specialties which take advantage of the uniform design and color scheme already associated with the name and trade-mark of the manufacturer in the mind of the buyer.

and tins are rarely, if ever, enclosed in cartons, it is true, but these were not in mind. The magenta colored underarm deodorant in the vase shaped bottle is perhaps the outstanding example. At the other extreme is that well-known laxative water with the red devil prominently displayed on the label. The former is a striking package, while the latter is certainly quite ordinary if not repulsive.

If the container is one such as many bath salts and body powder jars that has a practical use in the boudoir or in the home after the contents have been consumed, it is perhaps well not to enclose it in an individual carton. Then, too, if the container is so beautiful or striking that the temptation to reproduce it on the carton is irresistible, then certainly no carton should be used.

Many advantages attend putting the container in an individual carton, however, whether it be a cheap folding carton, an inexpensive set up box, or in keeping with the retail price of the product a costly, elaborate, satin-lined hinged box. Of greatest importance is that the carton permits the use of a folder or booklet as an enclosure. Thus, very complete instructions for use of the product can be given or beauty helps and hints in considerable detail can be offered. Likewise, a brochure that explains the merits of the product itself or one of advertising nature describing the manufacturer's other products may be enclosed.

In any case, if the individual carton is in keeping with the product and if it is in good taste

it can lend caste and dignity to the completed package. A lesson can be learned from the jeweler who can take a dime store string of beads, dress them up neatly and appropriately in an attractive box and make them look worth a dollar of anybody's money. Likewise, the haberdasher knows his stuff. He spends money pretty freely for boxes for mere man's socks, ties and sweaters for gift purposes.

The selection of a suitable carton or box for both appropriateness and attractiveness can be made a simple matter. Again, as with the formula itself, the opinion of the mere men of the organization should not be depended upon. This comment doesn't go of course if the product is a shaving cream, after shave lotion or other product prepared for the sterner sex. Nor should the opinions of the women in the organization, in the family, or in the circle of friends and acquaintances be given undue weight.

Invite Criticism

PACKAGES of competitive products may be collected. They may be stood up in a row and women of good taste invited to look them over and pick out the packages they feel are most pleasing and attractive. As in the questionnaire discussed earlier, it is important not to make any suggestions or express any personal opinions. Get each one to state just why she made her choice if she can find words to express and convey her reason.

With the notes assembled from the expressions of twenty-five or more women one can find out just which packages have made the most favorable impression. There will be a leaning toward certain sizes, colors, shapes and styles, pointing toward an ideal carton or box. Then the thing to do is to set to work to attain a container approaching this ideal. When it is completed, the reaction from a number of women (not in a group, however, but singly so the expression of opinion will not be biased by the others' opinion) can be gotten and it will soon be found whether the package is good or bad.

If the women who have passed opinion have been from the class to which the product will appeal by its price, quality and purpose, then the results of the above test can be depended upon as accurate and reliable. They represent the consuming public and the consuming public is both the judge and the jury.

A look at the shelves of the retail outlets will demonstrate whether this procedure has been followed. Most of the atrocious packages thereon could have been avoided and in their stead there would be packages of beauty, attractiveness and sales stimulating appeal. As for soaps, druggists usually stick them in an out of the way drawer, while the grocer puts them on the floor under the shelves well toward the rear. Few soap manufacturers have taken cognizance of this and then done something about it. True they have provided displays, special prices and the like to get them up on display but few, if any, have had the courage to restyle their cartons or their wrappers.

Many will admit their carton or wrapper can be improved upon. What then can be holding them back? The only fellow who can't afford to or doesn't dare to change his container is the isolated one selling only to the lowest strata of white trade and to colored folks. Possibly they would be too ignorant to appreciate or recognize the new. But who will admit this class as being *his* customers?

Directions for Use

DIRECTIONS for use are frequently carelessly prepared and even the verbiage is often poor. The greatest and commonest fault appears to lead off in bold face, large size type with the word "Directions" and then launch into a lot of "hokey" that is promotional copy. In fact, it is not uncommon to find a testimonial or two under directions.

Use of the second person is also to be decried. Hasn't the modern merchandising of specialties got past this? Yet a new dollar-a-throw shampoo used "you" and "your" freely. The label on the bottom of a \$1.25 jar of face cream states "4 Purpose Face Cream was created to flush

pores of Whiteheads, Blackheads; resupplies skin with natural oil it loses daily; banishing Wrinkles and Dryness. Hence must be applied twice daily to keep the skin soft and smooth." The misplaced caps and punctuation marks are copied verbatim. The label on a tissue stimulant states: "This oil sinks freely into the pores, stimulating and nourishing the tissues beneath." Both are rather slovenly English.

Cautions are admittedly bad sales-wise, but should be indulged in if necessary. A few examples follow. A time limit on leaving on of a depilatory or a caution about use before or after the use of deodorants is the part of wisdom. Otherwise, a woman may throw herself across her bed with arms overhead awaiting the dehairing action. If she drops off to sleep, a law-suit will be the ultimate outcome. Likewise, cautions about the use of cuticle remover in the manicure are in order. Infected fingers are also grounds for action.

Stain remover should carry a caution as to time to leave in contact with the fabric as well as stress the importance of a thorough rinsing out. If this caution is not advanced and the time recommendation not made a tendering or a bleaching of the fabric or both may result. Directions are sometimes wholly omitted. It would appear that directions are in order even in such homely widely used products as shaving cream and tooth paste.

Uses and Promotional Copy

THE questionnaires in every case can be made to yield new, different and unusual uses as well as unique appealing copy slants. An invitation to suggest new uses and a space for remarks and criticism on the questionnaire form is all that is required. If a product meets the approval of the testers, the adjectives, the superlatives and the clever expressions used to voice their enthusiasm will exceed those the average advertising copy writer or sales promotion man can conceive in a lifetime.

Likewise, the unusual uses to which a specially will be put by testers will exceed one's fondest hopes or gravest fears. In fact, the one charged with writing the sales promotion copy must be on his guard else he will find himself running wild as did the patent medicine man with his shot-gun prescription.

Silver cream has been used to clean everything from piano keys to painted woodwork. A laundry specialty containing bluing has been used to wash everything from the garage floor to the family pets and grandma's white hair. Dishwashing beads have found application from glass cleaning through removal of tea stains to taking grease off of the gas range and the ring out of the bath tub. Hand lotion testers have been

found to use it as a powder base, for sunburn, to relieve dry skin and remove freckles as well as the commonplace purpose for which it was prepared.

One or More Sizes?

THE number of sizes to be offered should come in for serious consideration. Whether one, two or three sizes should be offered may be considered in somewhat the same manner indicated for choosing the type of container. The advantage and disadvantages of each number of sizes may be set down for study. Every product presents an individual problem but a few generalities can be drawn nevertheless.

One small size causes the user to be without the product quite frequently because of forgetting to purchase a new supply. Witness the man becoming very economical as the last of his shaving cream is being squeezed from the tube or the housewife waxing frugal as she observes the bottom of her kitchen cleanser can being reached.

Each time that the new purchase is made it affords the opportunity for the voice of the salesperson or the urge of competing advertising or even the natural curiosity of the purchaser to switch to the trying of another brand. On the other hand, the more frequent the calls upon a dealer for any specialty, the more conscious it makes him of a seemingly large demand.

Of course, many products such as liquid floor wax, shaving cream, lotion, tooth paste, or laundry flakes have an upper price limit more or less set for them by custom. Or, is it because their manufacturers lack the courage to launch their specialties at a price higher than the usually accepted one? Yet, a soapless but lathering shampoo liquid in a 6-ounce size recently came out at \$1.00, sponsored by one of the largest soap manufacturers.

And this writer sat in when a package of specialty laundry flakes was priced at 25c for a 12½-ounce package, 39c for a 28-ounce package with the market flooded with 80-ounce packages at a fraction of this figure. The same was done with a laundry starch specialty and both were sales successes. At the same time, he wouldn't, for instance, relish being party to launching a new 25 or 35 cent toilet soap or a 5-ounce package of dish washing beads for 15c.

Inquiry developed the fact that several manufacturers refrain from putting a retail selling price on their package because of indiscriminate price cutting. By reason of this cutting their price does not mean anything and the different manners in which they refer to the reasonable price without naming it on the printed page or the carton are really clever.



This manufacturer gives a free trial sample in an attempt to break down sales resistance among buyers who want to try before they buy. Price on paper wrapper.

Affix or Omit Price?

QUESTIONS that must be answered before the decision to affix or omit the price follows: Are purchasers more likely or less likely to buy an item at 39c if a 50c price appears on the package for example? Or, assuming a specialty carrying a 35c price printed upon it offered at 33c alongside of one of same size carrying an equally good brand name at a 50c price offered at 39c. Will the prospect buy the latter in the belief that a better bargain is being obtained?

Whether the package is finally completed with or without the price appearing on it, why stick to even prices? There have been entirely too many even prices affixed when odd prices have proven their sales appeal beyond question in all kinds of retail outlets. Then, too, with 24 states already having retail sales taxes in effect, of from ½ to 3 per cent and other states

flirting with this same method of adding to their exchequers, why not take sales taxes into account seriously? Price a normally 35c item at 33c, a 50c item at 48c and a \$1.00 item at 97c or 95c, for example, so that the tax won't throw the total outlay over the even figure.

If the writer is accused of evading the question of pricing and whether or not to affix it, he openly pleads guilty. Each specialty presents an individual problem so only some of the pro and the con with a bit of food for mental exercise has been advanced.

Trade and Jobbing Discount

DISCOUNTS, both trade and jobbing, can be set only after weighing every consideration and with the aspiration to make everybody happy. Set too high, is fine during the introductory period as it should normally encourage dealer and jobber cooperation. Initially when the manufacturer would like to see the price cut so his specialty is competitive, the outlets maintain the retail price and pocket the extra profits. When a specialty has gained some consumer acceptance and the manufacturer would like to see the retail price maintained, the retail outlets cut and make a veritable football of it. Larger discounts, deeper cuts. That extra discount finally comes to be a permanent handicap, for just try to reduce it.

Discounts set too low is the best known way to cause apathy on the part of jobber and retailer alike. And specialty manufacturers lately generally acknowledge the important place of the dealer in all their merchandising efforts. Witness that most all current contests offer prizes to the dealers that sell to the winning consumers in amounts equalling the consumer winner's prize.

Size of Shipping Container

THE size of shipping container is frequently overlooked or given but scant attention. Competition may pack 50 or 100 and one-half or one gross, as with many toilet soaps, so the newcomer forthwith adopts the same size. He overlooks the fact that competition may be firmly entrenched and that retail outlets enjoy rapid turnover on their specialty.

How much better then until he, too, enjoys rapid turnover for him to pack in smaller units to insure fresher, less handled, more inviting packages being handed to the consuming public. And the jobber will appreciate smaller units, too. It is not a sign of weakness but of cooperation. One manufacturer packs his specialty for dime stores in one-half gross containers, the 35c size in two-dozen containers and \$1.00 size in half-dozens. These are not chance packings but were arrived at by a thorough study of sales.

Here again only one example will be indulged. One of the largest grocery chains carries about 825 to 900 items. Of this number, it is necessary in their warehouses for distribution to their stores, to split cases of some thirty odd items, mostly specialties. Splitting cases is not confined to canary seed and bird gravel but includes some slower moving cereals, bluing, toilet and laundry soaps, shoe polish, household cleansers, furniture polish and fly spray. Distributing warehouses of drug chains are veritable repackaging depots. If this condition exists in a grocery and drug chain what of the jobber in his shipments to the small humble slow turnover independents?

Generally, a larger size costs relatively but little more to produce than the smaller size. Yet an inducement, either in the form of a price concession or an extra volume or weight must be offered to the consumer to stimulate sale of the larger of the two or the largest of the three sizes. These inducements are bound to reduce the potential available volume, especially of those specialties with only a relatively thin market anyway. If it is actually reflected in reduced annual sales volume, then it follows that there must be an attendant reduction in the amount of money available for advertising and sales promotion and expense.

To those used to spending two, three, five or even ten per cent of gross in sales promotion, this doubtless appears to be carrying reasoning to the *n*th degree. However, for the benefit of the uninitiated, those who confine their sales effort to staples, it is not uncommon to spend forty or even fifty per cent of gross in sales expense and promotion.

All this appears obvious, yet it is not widely recognized. To cite only one example—a manufacturer of a specialty offers it in three sizes. His annual volume approaches one million dollars and his sales promotion costs are around \$410,000. The sales of the largest size ran \$28,800 and, worse than that, any purchaser of the largest size should have it to pass on to her grandchildren because the size is so large and because it is so infrequently and sparingly used. And this largest size continues to warm the dealers' shelves.

Bid For 10c Store Business?

OBVIOUSLY a specialty carrying a low retail price will make an active bid for the big volume, no credit loss, no delivery cost, low selling expense, sweet five-and-ten business. Specialties in the higher price brackets have quite a few questions that have to be satisfactorily answered before decision can be made.

Is the package one that can be reproduced in miniature size at a reasonable cost? This trade is insistent that the ten-cent size be a replica



Shall one or more sizes of a household product be marketed? Bringing the user back for a new supply has advantages, but every purchase entails the possible switch to another product.

or exact copy of the regular size and it is to the advantage of the manufacturer to make it so. It may in time replace sampling in whole or in part at a tremendous saving.

Is the package one that can be filled, closed, labeled, cartoned and packed economically on automatic or semi-automatic machinery? Only by getting the package and packing cost down to rock bottom can the specialty be produced at a profit when \$9.00 per gross represents the syndicate top and \$7.50 per gross or less it's average buying figure.

Will sales of the regular sizes suffer on account of the dime size? Almost without exception they will not suffer one iota. In fact, it is not uncommon for their sales to be materially increased. The dime size reaches consumers in the lower strata and of the colored race, the hardest classes to reach by any known form of sales promotion.

Costs

COSTS to the French perfumer selling his wares from \$2 to \$25 are one thing. To the manufacturer making specialties selling at popular prices, they are another. Innumerable instances come to mind where new specialties have no more than made their debut than evi-

dence of cost cutting is apparent to the observer. The reason is not far to seek. Costs looked in line all right but once in production unanticipated expenses and costs crept in that threw the total out of balance. Something has to be done about it.

The varnished or lacquered carton is replaced with a plain one and if the decorations are in pastel shades they smudge and soil terribly. The plastic closure or the shiny brass cap is replaced with a double shell metal or plain aluminum or lithographed tin one and all have been known to corrode under certain conditions on certain products. The embossed metal label gives way to a printed metallic paper one. The hand blown bottle retires in favor of the machine blown one. The three or four color job is bowed out by a two color one. The white patent coated news back carton board replaces the white clay-coated Manila back one. All in the name of economy.

How much better had costs been gotten in line in the first place. However, costs being cut at the expense of the appearance of the package is far better than shaving them at the expense of the contents. A little less of a little cheaper odor, a little higher filler content, a lower titre stearic acid, a talc that belongs under road rollers instead of one that has a rightful place on

the physiognomy, etc., etc., cannot help but undermine the dearly bought good-will.

Retail Price

THERE is always the question of what to name as the retail price and having fixed the proper retail, whether or not to affix the price on the package. Before everybody got so busy making a living that they have no time left for making some money, there may have been a few people to whom the price meant nothing. It would appear that at this date and for some time into the future, the retail price of any new article is going to be a big factor in determining its success or failure. This is true even though the public generally does not choose its movies by the numerals over the cashier's window or order its luncheons from the right hand column of the menu.

Priced too low, the public questions quality and is doubly critical of the product, else why do miniature sizes sell better than full-size packages in the dime stores. Priced too high, the consuming public has competitive products intelligently priced on which it can shower its patronage. And superlatives on the tongues of sales-people, on the printed page and on the radio won't sell over-priced specialties. For haven't the manufacturers of popular priced merchandise used all the superlatives anyway, whether the merchandise be autos, toilet soap or fly spray.

Separate Company for the Specialty?

NOW that the product itself is ready to be put into production and the merchandising is ready to be launched, the question may arise whether or not a separate company should be organized to exploit it. In the case of the manufacturer making a large number of products who adds a new one to round out his line, no special adieu is made of it. So, too, if a tooth paste manufacturer makes a mouth wash, a soap manufacturer offers a shaving cream or a shampoo, a deodorant merchandiser exploits a depilatory. In fact, if the manufacturer's new product fits in with those already established, he exercises good judgment and avails himself of the prestige he enjoys when he offers it under his own corporate name and trade-mark.

On the other hand, the manufacturer with an established specialty or two that develops a new product of a more or less foreign nature and whose trade-mark does not fit the new one, pursues the right course when he adopts a new trade-name. Under certain circumstances, he is justified in organizing, if not obliged to organize a new company to exploit this new specialty.

Conclusion

SOMEONE has said in substance "There is a stream of fortunes pouring out in ever increasing volume to the creators of things new. These things new may be little or great ones. They involve revolutionary changes or common-sense logical developments and, again, they may spring from ideas sound or unsound." However, this is no plea, no urge to undertake the development and exploitation of specialties. If a specialty is in process of development or if the urge to develop one exists, what has gone before is something of the *modus operandi*.

This discussion was started with the premise that losses of both money and prestige occur and products having all the ear-marks of a successful specialty languish and die because someone errs someplace along the route from idea to finished marketable product.

Errors will continue to be made, for certainly this discussion is no cure-all. It is hoped, however, that some of those in the throes of launching a new specialty will find what has been advanced helpful and may even use this for a guide. The ideas advanced have been used or developed over a period of eighteen years. The ratio of successes to failures is doubtless higher having been systematic and schematic than had slipshod, "hope-for-the-breaks" procedure been followed.

The whole has been written in rather light and flippant vein and why not? Manufacturers are prone to take themselves and the development and exploitation of their specialties entirely too seriously. As for the consumers, they don't look upon buying a cake of soap, a tube of shaving cream or a jar of facial cream as such a serious business. "I'll stick to my horse" will probably sell more gasoline than "99 million foot pounds per gallon."



How To Buy Sanitary Specialties

What the Jobber or Janitor Supply House Should Look for and What He Should Avoid in Purchasing Bulk Sanitary Supplies

AS A preface to considering what a buyer of sanitary supplies *should* look for in purchasing these products, stop for a minute to ask what he *does* look for. The answer, far too often we are afraid,—is the lowest price. A lesson which seems very hard to learn is that the buyer who insists upon buying at the lowest price gets, in nine cases out of ten, products which are distinctly inferior. By giving his business always to the lowest bidder, he finds in the end that he is far too often doing business with the lowest fringe of the supply trade, for it is obvious that the manufacturer of honest merchandise cannot compete on price terms with the cheapest of his cut-price competitors. There are times, of course, when a cheap product is desired for a particular purpose, and then price considerations must rule. To buy all supplies, however, at all times, on a basis of price alone, is to run the risk of getting products which are expensive to handle at any price. Poorly made goods may even damage property in addition to failing in their task. Fooling with cheap, poorly-made untested products has lost many a profitable account.

Powdered Soaps, Soap Powders, Scouring Powders

AS POWDERED soaps are some times confused with soap powders, it might be well to draw a line of distinction between the two. Powdered Soaps consist almost entirely of pure soap of very low moisture content ground to a powder. Because they are pure soap, naturally they are priced higher than soap powder compounds. They are used principally in the cleansing and finishing of textiles and fine fabrics and in those situations where mild, yet highly active detergents are indicated. They are sometimes used (in solution) in the cleansing of fine wood finishes in offices and hotels, though in such cases soap chips are perhaps to be preferred because of the ease in handling and soluble qualities. Powdered soaps go principally into tooth paste and powder, powdered hand soaps, toilet articles, and other products used chiefly on the human body.

THESE suggestions on points to watch in the purchase of soaps and sanitary specialties have been compiled from a series of articles prepared by a group of recognized experts in their particular fields. The publishers wish to express their indebtedness to the following men for their assistance in preparation of this material: L. B. Schwarcz, Clifton Chemical Co.; C. C. Baird, Baird & McGuire, Inc.; Henry Nelson, Chemical Supply Co.; Joseph Fuld, Fuld Bros., Inc.; E. S. Pattison, Mathieson Alkali Works; D. J. O'Sullivan, Armour & Co., and T. V. DuBois, DuBois Soap Co.

Soap Powders are suggested for what may be classified as "rough work"; the cleansing of wood floors, tile, machinery, etc. Soap powders usually consist of a small percentage of pure soap, at least 10%, seldom more than 20%. To the powdered (anhydrous) soap are added various alkalies such as trisodium phosphate, sodium carbonate (soda ash) and borax. The effect of these alkalies and other similar ones is to cut and loosen grease and dirt. They also act as water softeners.

Just how much soap and how much alkali a soap powder should contain is a moot question, but it should always be remembered that soap itself is the most costly ingredient, and the higher percentage of soap contained in powder, the higher the cost of manufacture. However, as stated above, a good soap powder for general purposes need not contain more than 20% pure soap. Anything less than 10% of soap reduces sudsing and detergent value and places the full burden of cleansing on the alkalies contained in the powder.

Scouring Powders (Cleansers) are compounds of powdered soap, mineral abrasive and sodium carbonate. Mineral abrasives used are volcanic ash, which is a form of rock composed of finely powdered, light, porous, siliceous material, powdered silica, feldspar and other minute sharp-face minerals. The abrasive used

most generally is volcanic ash. The activity of any scouring powder depends on the type and coarseness of the abrasive used. This varies between abrasive powders that must pass through a number 200 mesh down to those passing through number 60 mesh screens. Cleansing action is increased by the addition of a small amount of alkali, usually sodium carbonate, which serves to loosen and cut grease and dirt.

The ideal scouring powder should contain approximately 90% abrasive which should be coarse enough, have enough "teeth," to pick up dirt, yet still be fine and soft enough not to scratch ordinary surfaces. A good scouring powder should be dry and free flowing, should not contain more than 5% moisture. If it contains more than 5% moisture, it will likely become lumpy and hard to handle. The purchaser should always insist on dry powder and free flowing qualities.

Scouring powders are low-price items, and it therefore becomes important to realize that there are wide differences between them. Fairly wide differences in price are therefore perfectly understandable. Indeed, in many cases, the higher priced product will prove both the better and the more economical in the end.

Right here is where the seller's standing enters. Certain scouring powders have established the right to the respect of every buyer. They are well made, they are uniform from barrel to barrel, and they claim to be only what they really are,—not universal cleansers, but good, serviceable scouring powders. Nearly every buyer is acquainted with at least one of these powders. It is well to be very cautious about using new and unheard of scouring powders without careful practical tests. Buy from a reliable maker, observe the work which the powder does, as compared with whatever you may have used before and as compared with the statements that the salesman may have made when you placed the order. It is frequently wise to pay a little more per pound if it will give you a powder which does your work better, more safely, or at a lower cost per cleaning. But don't pay such higher price until you are convinced that the powder is really doing this better job for you.

Liquid Soap

IT HAS usually been a common practice to judge liquid soap solely on the basis of anhydrous content. However, it is easy to be misguided by following this procedure, as the anhydrous content is only one part of the picture, and there are other very important features of a liquid soap that should be investigated before trying to make final judgment as to quality.

As a comparison, it would be just as unwise to purchase a diamond exclusively on the basis of carat weight. One two-carat stone may be worth a few hundred dollars and another weighing the same may cost several thousand dollars, due to shape, cut, flawlessness, etc. A similar analogy could be applied to any number of other products with the same result, viz:—That the worth of an item can rarely be judged by one single yardstick.

Even if liquid soap is purchased according to U. S. Government or some other specification, one is not always assured of getting a strictly high quality soap, as there are loopholes which are not covered. For instance, most specifications call for pure vegetable oil and in some cases specify a coconut oil soap made with potash or potash and soda. However, the grade of coconut oil is seldom, if ever, mentioned, and as a result, Manila, Ceylon, fatty acids or other cheap oils may be used, all of which are less desirable than pure Cochin coconut oil.

Then again although a liquid soap may pass the laboratory test in regard to leaving no objectionable odor on the skin *at the time of testing*, it often occurs that a poorly made soap develops a rancid and in some cases a nauseous medicinal odor. This is due to the fact that some commercial caustic potash contains small amounts of potassium chlorate and other salts, which under certain conditions react on the caproic, capric and butyric acids in the coconut oil to form other acids such as crotonic and acrylic, which cause the unpleasant odor referred to. Unless the soapmaker knows through long experience, how to take care of this condition, the undesirable odors may develop.

In most specifications, a potash, or potash and soda soap is permitted, with a result that when there is a sufficient variation in price between these two caustics, too much of the latter may be used, which makes a soap that tends to thicken and become unduly cloudy, especially if the minimum free alkali is lacking.

Fine cooking and expert soap making are very much akin. Two cooks can use exactly the same ingredients and one of them will turn out a tasty dish that will delight the palate of an epicure, whereas another cook using identically the same ingredients will evolve a concoction at which a cat would turn up his nose. There is a good deal of good old fashioned cookery in being able to turn out a high quality liquid soap. The fine points in the ability to manufacture a quality soap are not learned in a day or year, or are they gleaned from books. Some old time liquid soap makers guard their methods and secrets jealously.

A few makers of the outstanding quality liquid soap allow it to age in cypress tanks for some time. For reasons not completely explainable by chemistry, liquid soap like fine whiskey and old violins improve with age. Aged liquid soap is softer, more gentle, and smoother.

Let us try to ascertain what other characteristics constitute an outstanding liquid soap. As anhydrous content was previously mentioned, it may be well to dwell on this before proceeding further. A 15% to 20% soap content usually gives good satisfaction. An inadequate concentration such as 8%, 10% or 12%, as a rule will not give sufficient lather under ordinary conditions and as a result the user is apt to overcorrect the poor sudsing qualities of the soap by working the dispenser considerably more times than necessary. Therefore the theoretical saving of using a low strength liquid soap is usually more than offset by the larger quantity of soap used.

On the other hand a soap of 22% or 25% content or higher is not recommended, as it has a tendency to leave the hands greasy if not thoroughly rinsed off. Then again the thicker the soap is, the more likely it is to clog the dispensers. Jobbers as a rule should not recommend a 40% soap to their customers, unless they feel assured that it will be accurately mixed with water before the dispensers are filled. Porters are notoriously inept even in plain arithmetic. For instance, one concern with branches all over the country, buys a 40% concentrated soap. On a check up of the diluted liquid soap that was actually contained in the various dispensers, it was found that the concentration ranged from 8% all the way up to 40%, — even though all dilution instructions were exactly the same! In one case the porter forgot the water, and in the other he all but forgot the soap.

It is satisfactory for the jobber to utilize base and concentrated soap if he has the time and facilities for reducing them to the proper concentration. Many, however, prefer to buy the finished product from the manufacturer. Though it may cost a trifle more, it is often worth it.

There is probably no one "best" liquid soap, as the proper type depends entirely upon the particular purpose for which it is to be used. For public places, where the cost is the main factor, a pure coconut oil soap may be used, as this type gives the maximum lather. In offices, or where there are a large number of girls employed, it is sometimes preferable to supply a soap made from a mixture of coconut and olive, or other bland oil, as a straight coconut oil product has a tendency to roughen some delicate skins. Such complaints are more apt to occur in winter. In many cases the soap

may not be at fault, due to the fact that plain water or even cold weather alone may cause chapping, and the blame is erroneously placed on the soap. In factories where the workers get a lot of grease and dirt on their hands, an ordinary coconut oil liquid soap may not cut the grease fast enough and the addition of a percentage of a mild detergent is helpful.

In general, the higher the olive oil content, the softer the liquid soap. On the other hand a pure olive oil soap gives a sparse lather unless highly concentrated. The concentrated type on the other hand will tend to gum up the ordinary soap dispenser. However, in hospital maternity wards special dispensers are used and a pure concentrated olive oil soap works satisfactorily.

In the foregoing discussion we have tried to emphasize that materials and soap strength alone are not all-sufficient. It is important, of course, to know what type soap you are getting and in exactly what concentration. There are other quality factors of paramount importance also, however, which depend on experience, skill, equipment and integrity of your supplier.

Deodorizing Blocks

WITH an almost endless number of brands of paradichlorobenzene products on the market, all designed for deodorization, moth control and other sanitary uses, the jobber is very frequently puzzled as to which brand or brands to handle because he does not always know what constitutes a genuinely first-class article. With all kinds of blocks, cakes and crystals available, some good and some not so good, his uncertainty may urge him to buy the cheapest and in this, he frequently makes a grave error.

The first requisite of a strictly high-grade para block is that it shall be made solely from pure paradichlorobenzene. Admixtures of other products, such as naphthalene and inert fillers in a para block reduce its quality and are primarily to cheapen the block. Naphthalene blocks and crystals unquestionably have their place in the sanitary products field, especially in moth control, but the addition of naphthalene to paradichlorobenzene blocks is distinctly not good practice.

The addition of naphthalene or useless fillers such as talc, salt, or other cheap crystalline or powdered material, is rather easily detected by examining the block after it has been in contact with the air for a week or so. If naphthalene is present, the surface will be pitted as the naphthalene has a slower rate of evaporation than the para. If an inert powder or other filler has been added, this will begin to deposit on the surface around the block after it has started to gasify. A pure para block correctly manufac-

tured will evaporate evenly without pitting or leaving any residue behind.

Another factor which is important to the jobber who handles para products, is the appearance of the block and the relation of this to its quality and price. Good para blocks should have an even density, and a smooth, even surface. The best blocks are made in various types of presses from cold para crystals. The greater the pressure, the better the block is ordinarily. A well-pressed block should be dense and heavy for its size. A poorly pressed block may look large and look like a lot for the money, but it is probably light in weight and contains less para than the good block. Therefore, size in the block may misguide the buyer unless he knows what it means. Weight is the proper basis on which to judge value. Furthermore, a light loosely packed block will evaporate too rapidly, too unevenly, and will crumble and fall apart.

The earliest procedure in the manufacture of blocks was to melt up the pardichlorbenzene crystals and then pour the highly volatile liquid into molds to cool and harden. The chief advantage of this method is that the cost of equipment is extremely small. The loss of para by evaporation while hot, which runs up to 25 per cent, and the loss of perfume added to the hot liquid, which runs up to 60 per cent in some cases, is highly wasteful. Furthermore, air pockets are likely to form and the inside of such blocks are frequently crumbly and brittle. It is also almost impossible to secure uniform blocks. This type of block does not give great satisfaction to users.

The economical method for making small blocks is by use of the machine or foot press. This is for the three and four ounce sizes. Although the foot-press blocks are not as well pressed as a machine-pressed block, they are superior to the molded blocks. Of course, it is impossible to make the 1½ and 2½ pound sizes on a foot-press. The pressure needed to press these large blocks runs well into the tons and it must be secured by especially built automatic presses or hydraulic presses. The latest development in this field is the powerful electric automatic press which gives a pressure of from 60 to 100 tons, and will turn out 25 to 60 blocks per minute. These blocks can be recognized by their firmness, density, uniformity, and their long-lasting qualities when used.

In selecting blocks, care should be taken that the perfume is of the correct type or it will not be satisfactory. Some perfumes last only during a very short period of the life of the block. Sometimes they are used in too great a quantity and make the outside of the block wet and greasy. The same thing may occur where the

wrong kind of perfume material is used. This "sweating" not only makes the block greasy to handle, but will cause running and may streak walls as well as making the container very messy. The perfume used with para should have approximately the same rate of evaporation as the block itself and should last until the last few crystals with a uniform intensity of odor. If the block has no perfume when the para is half or nearly all evaporated, it is evidence that the wrong type perfume has been used.

In the matter of coloring para blocks, it may be said that the tendency of late has been toward using more plain white blocks. The possibility of staining and of the color residue being left in holders has accounted for this. However, where the three and four ounce cakes are to be used exclusively for urinal deodorization, color adds to the appearance and may "match" the odor. However, in general, tinted blocks are not recommended for moth control work or where they are used in wall holders.

It has been said that the best blocks are made from pure paradichlorbenzene. Of course, blocks made wholly from naphthalene are available and also serve a definite purpose. They are considerably cheaper than para blocks owing to the fact that naphthalene sells for less than half of the price of paradichlorbenzene. Where a cheap product must be furnished, naphthalene blocks offer a suitable substitute for para blocks. The naphthalene evaporates less rapidly than para, its odor is not as intense, and it does not cover other odors as well for this reason. For moth control work, naphthalene and para are held on approximately an equal plane by the Department of Agriculture.

Coal-Tar Disinfectants

AN IMPORTANT feature of coal-tar disinfectants is that their strength or power to kill harmful disease bacteria may be accurately determined. As a result of this determination the consumer may know exactly how to dilute the fluid and apply it for specific purposes. Disinfectants made from coal-tar are available in strengths ranging from two to twenty times that of pure carbolic acid. They mix freely with water to form emulsions and are suitable for application in the form of washing, mopping or scrubbing solutions.

In buying a coal-tar disinfectant in ordinary quantities the buyer should insist upon having from the manufacturer a written statement of the bacteriological strength (phenol coefficient) of the disinfectant supplied. This should agree identically with the statement on the container. In buying large quantities, a certified copy of

the bacteriological test should be supplied by the seller. This test sheet shows the actual phenol coefficient against the germ of typhoid fever. The test method used today is that of the Food and Drug Administration of the U. S. Department of Agriculture, and supersedes the Rideal-Walker and Hygienic Laboratory tests which were formerly in use. In addition to the test sheet, the manufacturer should declare the phenol coefficient on the container, as well as on the invoice. This is for the buyer's protection. If such statements are not made, the responsibility for the strength and quality of the product is shifted from the manufacturer to the buyer. The Federal Law requires too that the name and percentage of inert ingredients shall also appear on the label or container. These are simple but important things to look for.

Coal-tar disinfectants contain water, usually not over 10%. As water is without germ killing power, it has to be listed as an inert ingredient, both by name and percentage. Disinfectants with an excessive amount of water should be avoided, as well as those which contain such adulterants as mineral oil (kerosene). The important factor of course is the phenol coefficient, for that is the true index of the worth of the product. Buyers should demand it, not only on containers shipped to them but on invoices too.

When coal-tar disinfectants are properly manufactured they should be free from sediment and the emulsions should not show any separation of oil when diluted with water, that is oily drops floating on top. The odor should be characteristic of tar and suggest cleanliness. The correct amount of water to use in preparing solutions for general use is arrived at by multiplying the coefficient by twenty. Thus a disinfectant with a coefficient of six should be diluted with 120 parts of water, and one with a coefficient of twenty with 400 parts of water. It is obvious that the higher the coefficient, the greater the amount of water to be used. Disinfectants with phenol coefficients of 20, when diluted for use, cost on the average less than a cent a gallon.

Cresol compounds are disinfectants of the so-called soluble type. They are prepared from coal-tar and are excellent germicides. Two grades are available; one meeting the specifications of the U. S. Pharmacopoeia and known as *Liquor Cresolis Compositus*, U. S. P., and the other which is sold as technical or commercial cresol compound. These disinfectants are largely used by hospitals, veterinarians and surgeons. As they are clear in solution, operating instruments immersed in a bath of the fluid may be clearly seen. The phenol coefficient of the U. S. P. compound varies between 3 and 3½, while the technical or commercial grade has a

coefficient of around four. The odor of cresol compounds is suggestive of that of cresol or cresylic acid. Cresol compounds, meeting the specifications of the Bureau of Animal Industry, U. S. Department of Agriculture, are used in disinfecting premises which have contained diseased cattle.

Pine Oil Disinfectants

THE problem of choosing between the many brands of pine oil disinfectant, offered at so many different prices, is aggravated by the fact that the quality of the disinfectant really cannot be determined except by a bacteriological test, and few buyers have the facilities necessary to make such a test. Nevertheless, there are ways by which the buyer can protect himself and make sure that the pine oil disinfectant offered him is the grade he wishes to handle. To begin with, the Department of Agriculture specifies that a pure pine oil disinfectant shall be made only from pine oil, soap, and water. Consequently, a product that contains hydrocarbon oil (kerosene) cannot be legally sold as a "pine oil disinfectant". Such a product, to be within the law, must be sold under a different name, and the seller is required to make specific mention on his label of the percentage of hydrocarbon oil in his product, and to declare it as "inert matter", since hydrocarbon oil does not possess disinfectant qualities.

Reputable manufacturers of pine oil disinfectants are always willing to give a certified analysis, and this, when given in writing, is the best assurance a buyer can have, provided he knows what to ask for. A dependable pine oil disinfectant, when made with rosin, should contain approximately 70% steam distilled pine oil, 21% rosin soap, with inert matter (water) of not over 9%. Pure pine oil disinfectants can also be made with vegetable oil soaps, instead of rosin soaps. In that case the percentage of soap may be as low as 9% and the water as much as 21%. Since water has no disinfectant value, it must always be declared on the label as "inert matter".

Another thing to look for when buying pine oil disinfectant, is a statement of efficiency, which indicates germ killing strength. The Government requires that this appear on all packages. Pine oil disinfectant is usually offered with a coefficient of either 3 or 4, and the difference in the wholesale price between these two grades is about five cents per gallon.

Do not be misled by the color of the disinfectant. Some sellers would have you believe that color determines the efficiency and germicidal quality of the disinfectant. That is an erroneous belief. Pure pine oil disinfectants, made with rosin soap, often are darker in color than those made with vegetable oil soaps, yet the coeffi-

ciency of both commercial grades is practically the same.

There are pine oil disinfectants on the market made with destructive distilled pine oil instead of steam distilled pine oil. The former have a rather pungent odor and are cheaper than those made with genuine steam distilled pine oil. There are also pine oil disinfectants which are made with pine oil of inferior quality. Naturally, these, too, can be offered at lower prices than the dependable grades which are made with pine oil of predetermined specifications.

It is thus readily apparent that pine oil disinfectants may be had in different qualities and at many varying prices. The safe course to follow, obviously, is to insist that your supplier furnish you with disinfectants of proven quality. Ask him to give you in writing:

1. A certified analysis showing percentages of pine oil, soap, and water.
2. A guarantee that the disinfectant is made from steam distilled pine oil according to specifications by the leading producers.
3. A guaranteed efficiency appearing on every package. This efficiency should be either 3 or 4 by the F. D. A. Method. (Food and Drug Administration Method.)
4. Proof of his business standing—which after all is your ultimate guarantee of his dependability.

Chlorine Disinfectants

THERE is no perfect disinfectant for every purpose, any more than there is a single perfect detergent. Thus the user of disinfectants should be careful to weigh the advantages and disadvantages of various type products for the purpose which he has in mind. A dependable chlorine disinfectant, for example, while unsuitable for some purposes, has other fields of usefulness for which other disinfectants, such as phenol and its derivatives, are clearly unsuitable. On food-handling equipment, for instance, a sodium hypochlorite solution provides the following advantages:

1. It is non-poisonous in concentrations of high germicidal efficiency.
2. It is colorless, leaving no stain or other objectionable residue (on the contrary, it acts as a stain remover).
3. After it has done its work, its only decomposition product is sodium chloride (common salt).
4. It acts as a deodorant as well as a disinfectant, the chlorine odor disappearing rapidly after use.
5. It has the approval of health authorities for use in food-handling establishments.
6. It is inexpensive enough to permit fre-

quent use on all surfaces subject to bacterial contamination.

7. It kills bacteria rapidly and effectively.

In some cases, confusion has arisen from the attempt to express the germicidal effectiveness of chlorine disinfectants in terms of the "phenol coefficient". As the U. S. Department of Agriculture has pointed out, under certain conditions a chlorine disinfectant such as sodium hypochlorite is many times more powerful than phenol. Under other conditions, such as in the presence of an excess of organic matter, it may be less effective. As a means of comparing germicidal efficiency in practice "phenol coefficient" is meaningless when applied to chlorine solutions.

In the effort to make practical utilization of the germicidal power of chlorine, the following general types of products have been developed:

1. Chlorinated lime
2. Liquid sodium hypochlorite solutions
3. Chloramine products
4. Alkaline powders, primarily detergents, containing a small percentage of "available chlorine"
5. True calcium hypochlorite powder
6. Powder yielding sodium hypochlorite solutions when added to water

In solution, all of these products are "oxidizing agents", and act upon bacteria as a result of this oxidizing ability. With the exception of the chloramine products, hypochlorite ions (OCl) formed in solution provide this oxidizing power. The capacity of these products to do an oxidizing job is commonly expressed as "available chlorine", which is simply the ratio of their oxidizing capacity to that of pure chlorine itself.

As disinfecting solutions are usually made up with some fixed concentration of available chlorine (100 p.p.m. = 100 parts available chlorine to 1,000,000 parts of solution), the available chlorine of any product is a rough measure of its value as a disinfectant. Taken in comparison with the weight and cost of a product, it gives the first rough basis for comparison.

The fact that two solutions are made up to contain the same amount of available chlorine, however, should not be taken to mean that they are equally effective in destroying bacteria. "Available chlorine" is simply a measure of the oxidizing capacity of a product. Now two tanks of water may have the same capacity, but other factors may make it easier to get water out of one than out of the other. Similarly, two solutions may be prepared containing the same available chlorine, but a more rapid release of this oxidizing capacity may make one of them decidedly superior in germicidal speed and effectiveness.

"Well why not pick the product that acts the

quickest and let it go at that?" you may ask. But the answer, unfortunately, is not so simple as that. As a matter of fact, perhaps the most important question of all that must be asked when choosing a chlorine disinfectant is this: "Is it stable and uniform?" No matter what other properties a product may have, it will appeal to few users if they cannot be sure of its action at the time and place it is most needed. It is this lack of stability and uniformity that have always been the chief drawbacks of chlorinated lime and old fashioned liquid sources of hypochlorite.

True calcium hypochlorite, however, is a powder which retains its strength both in dry form and in solution. With this product, it is possible to prepare calcium or sodium hypochlorite solutions of definite concentration and germicidal effectiveness.

The use of chlorine disinfectants is somewhat limited, of course, by their tendency to corrode. On glass-lined tanks, stainless steel, or non-metallic equipment, they can be used without fear, but on tinned iron, tinned copper, nickel and other surfaces, some modification of the solution is necessary to protect against corrosion. As the alkalinity of the solution is raised, its corrosive tendency is decreased. However, the rate of germicidal action also falls, so that a longer period of contact is required. In every case, however, a satisfactory balance can be obtained. For safe and practical general use, a prepared hypochlorite is desirable; one with an alkaline balance sufficiently high to reduce the corrosion hazard, while leaving the germicidal speed as rapid as conditions of use require.

Metal Polish

THERE are five types of metal polish, each of which has recognized advantages and disadvantages for certain different types of work. The ideal polish (if one existed), would necessarily have the good qualities of all five types and none of the bad. Since no one polish can do everything equally well, two or more metal polishes are generally needed. And many building superintendents find an advantage in having paste polishes, powdered polishes and several different liquid polishes. Metal polishes are generally divided into five types:

1. Water Base
2. Petroleum Base
3. Petroleum Base (non-inflammable)
4. Paste
5. Powder

There is no way to judge the quality of a polish except by comparative test, but even such tests are often misleading unless one is comparing polishes of similar type upon identical jobs. Polishes depend upon the combined action of chemicals and abrasives. While it is impossible here to go into all of the peculiarities of each ingredient used in polishes, it may be said generally that the more solid the polish, the more it requires rubbing. And the more liquid it is, the more it depends upon chemical action. There are, however, some exceptions to this general statement.

The results which usually interest polish buyers are (1) Depth of luster; (2) Speed in application; (3) Ease in removing; (4) Lasting quality of luster; (5) Adaptability for special surfaces (rough and hot). Below is a table arranged to show how the different types of polish compare on the basis of the above points.

TYPE	Speed in Applying	Depth of Luster	Ease in Removing	Lasting Luster	Adaptability for Special Surfaces rough hot
Water Base	A	C	C	C	C
Petroleum Non-Inflammable	B	A	A	A	D
Petroleum	C	B	A	B	A
Paste	D	C	D	B	X
Powder	D	D	C	B	X

A—Excellent B—Good C—Fair D—Poor X—Unsuitable

There are other commonsense considerations which should be kept in mind when choosing or recommending metal polishes. They are: *Sliminess, stickiness or gumminess* in polishes usually indicate presence of a film around the abrasive particles which retards their polishing action.

Very thin polishes are usually wasteful.

Inflammable polishes are always a fire hazard.

Strong smelling polishes are usually objectionable for indoor use.

Free acid in polishes usually causes speedy re-corrosion, and may also pit or etch metals.

Caking of polishes is usually wasteful of both time and the polish.

Harsh abrasives in polishes may scratch soft metals. They often ruin nickle.

Poisonous ingredients in polishes are always objectionable around foods and children.

Excess alkali in polishes frequently injures the nails and skin of users.

Federal Specifications for Soap Products*

Automobile Soap (P-S-561)

Automobile soap shall be a pure vegetable oil paste soap containing no free alkali or acid, shall be relatively free from matter insoluble in alcohol, shall be homogeneous, free from adulterants of any kind, and without objectionable odor.

Matter volatile at 105° C. shall not exceed 55 per cent. Deliveries which yield more than 55 per cent of volatile matter will be rejected without further test. The sum of free alkali and total matter insoluble in alcohol shall not exceed 1 per cent. Free alkali, calculated as sodium hydroxide (NaOH), shall not exceed 0.2 per cent. Free acid, calculated as oleic, shall not exceed 0.2 per cent. Matter insoluble in water shall not exceed 0.2 per cent. Unsaponified matter shall not exceed 4 per cent. Rosin shall not be present. The percentage of matter volatile at 105° C. will be computed on the basis of the soap as received, but all other constituents will be calculated on the basis of material containing 50 per cent of volatile matter.

Chip Soap (P-S-566)

Chip soap shall be a soap in chip form made from soda and fats, without rosin, as free as possible from water and all substances other than true soap, of a light uniform color, free from disagreeable odor, and suitable for high-grade laundry work with soft water, when the presence of alkaline salts is objectionable.

Matter volatile at 105° C. shall not exceed 15 per cent. Deliveries which yield more than 15 per cent of volatile matter will be rejected without further test. The sum of free alkali, total matter insoluble in alcohol, and sodium chloride shall not exceed 3 per cent. Free alkali, calculated as sodium hydroxide (NaOH), shall not exceed 0.5 per cent. Matter soluble in water shall not exceed 0.4 per cent. Titer of the mixed fatty acids prepared from the soap must be not less than 39° C. The percentage of matter volatile at 105° C. will be computed on the basis of the soap as received, but all other constituents will be calculated on the basis of material containing 10 per cent of volatile matter.

Cake Grit Soap (P-S-571)

Cake grit soap shall be of the following types as specified: Type A—for fine work, such as glass and enamel; Type B—for scouring and scrubbing.

Type A—

Matter volatile at 105° to 110° C. shall not exceed 4 per cent. Deliveries which yield more than 4 per cent of volatile matter shall be rejected without further test. Alkali as alkaline salts (total alkalinity of matter insoluble in alcohol), calculated as sodium carbonate (Na_2CO_3), shall not exceed 1 per cent. Free alkali, calculated as sodium hydroxide (NaOH), shall not exceed 0.1 per cent. Insoluble siliceous material shall be not less than 88 per cent nor more than 93 per cent. The insoluble siliceous material shall consist of not less than 90 per cent of ground feldspar. All of the insoluble siliceous material shall pass through a No. 100 sieve, and the residue retained on a No. 200 sieve shall not exceed 5 per cent. Rosin, sugar, and foreign matter shall not be present. Anhydrous soda soap shall be within 1 per cent of the difference between 100 and the sum of the matter volatile at 105° to 110° C., insoluble siliceous material, and alkali as alkaline salts. The cakes shall be well compressed and of a satisfactory degree of friability, which shall not be materially affected or lessened after immersion in or contact with water. The material shall not scratch glass or enameled surfaces. The material shall be unscented and shall be of a light gray or white color.

Type B—

Matter volatile at 105° to 110° C. shall not exceed 5 per cent. Deliveries which yield more than 5 per cent of volatile matter shall be rejected without further test. Alkali as alkaline salts (total alkalinity of matter insoluble in alcohol), calculated as sodium carbonate (Na_2CO_3), shall not exceed 3 per cent. Free alkali, calculated as sodium hydroxide (NaOH), shall not exceed 0.1 per cent. Insoluble siliceous material shall not be less than 75 nor more than 85 per cent. The insoluble siliceous material shall be mainly quartz, and it all must pass through a No. 100 sieve. Rosin, sugar, and foreign matter shall not be present. Anhydrous soda soap shall be within 1 per cent of the difference between 100 and the sum of the

* General and Detailed Requirements as specified in the Standard Stock Catalogue of the U. S. Federal Specifications Board.

matter volatile at 105° to 110° C., insoluble siliceous material, and alkali as alkaline salts. The cakes shall be well compressed and of a satisfactory degree of friability, which shall not be materially affected or lessened after immersion in or contact with water. The material shall be unscented and shall be of a light gray or white color.

Hand Grit Soap (P-S-576)

Hand-grit soap shall be a cake soap containing about one-third its weight of clean, finely divided insoluble siliceous matter, as free as possible from water, uncolored, unscented unless otherwise specified, thoroughly saponified, and well compressed in firm, smooth cakes.

Matter volatile at 105° C. shall not exceed 25 per cent. Deliveries which yield more than 25 per cent of volatile matter will be rejected without further test. Alkali as alkaline salts (total alkalinity of matter insoluble in alcohol), calculated as sodium carbonate (Na_2CO_3), shall not exceed 1 per cent. Free alkali, calculated as sodium hydroxide (NaOH), shall not exceed 0.1 per cent. Insoluble siliceous material shall be not less than 25 nor more than 40 per cent. The insoluble siliceous material shall not yield more than 2 per cent of residue retained on a No. 100 sieve and not more than 10 per cent of residue retained on a No. 200 sieve. Rosin, sugar, and foreign matter shall not be present. Anhydrous soda soap shall be within 1 per cent of the difference between 100 and the sum of matter volatile at 105° C., insoluble siliceous material, and alkali as alkaline salts. The percentage of matter volatile at 105° C. will be computed on the basis of the soap as received, but all other constituents will be calculated on the basis of material containing 25 per cent of matter volatile at 105° C.

Liquid Laundry Soap (P-S-586)

Liquid soap for laundry use shall be a clear solution of pure potash (or potash and soda) soap with or without glycerol or alcohol and containing not less than 12 per cent by weight of a volatile organic solvent or a mixture of such solvents. It shall yield a clear solution on mixing with soft water, shall quickly form a satisfactory lather, shall have no injurious effect and leave no objectionable odor on fabrics. Materials washed with this soap shall have, after drying, a soft feel and not appear more boardy or stiff than when washed with soft water.

The material shall be a clear solution, shall yield a clear, homogeneous solution on mixing with soft water, shall quickly form a satisfac-

tory lather, and shall leave no objectionable odor on fabric. Total anhydrous soap shall be not less than the equivalent of 24 per cent potash soap. Total matter insoluble in alcohol shall not exceed 0.5 per cent. Free alkali, calculated as potassium hydroxide (KOH), shall not exceed 0.05 per cent. Chloride, calculated as potassium chloride (KCl), shall not exceed 0.3 per cent. Total matter insoluble in water shall not exceed 0.1 per cent. Volatile organic solvent shall be not less than 12 per cent. All constituents shall be calculated on the basis of the original sample. Fabric washed with the liquid soap shall show no more shrinkage or felting than occurs with similar fabric washed with soft water at the same temperature. Colored materials when washed with this soap shall not fade more than when washed the same number of times at the same temperature with soft water alone.

Ordinary Laundry Soap (P-S-591)

Ordinary laundry soap shall be a well-made, uniformly mixed laundry or common soap, made from soda and fats, with no excessive proportion of rosin and a moderate amount of matter insoluble in alcohol; shall be free from makeweights, and shall be suitable for use with moderately hard water for general cleaning and laundry purposes.

Odor shall not be objectionable in the soap as received or in a hot solution of the soap in water. The material shall not leave an objectionable odor on dishes or other objects after washing with a water solution of the soap and rinsing thoroughly with hot water. If desired, the odor of the material under the above conditions shall conform to the odor of a sample mutually agreed upon by buyer and seller. The mutually agreed upon sample shall be kept in an air-tight, closed container for comparison with samples from deliveries.

Matter volatile at 105° C. shall not exceed 36 per cent. Deliveries which yield more than 36 per cent volatile matter will be rejected without further test. The sum of free alkali, total matter insoluble in alcohol and sodium chloride, shall be not less than 2 per cent nor more than 10 per cent. Free alkali, calculated as sodium hydroxide (NaOH), shall not exceed 0.5 per cent. Matter insoluble in water shall not exceed 1 per cent. Rosin shall not exceed 25 per cent. The percentage of matter volatile at 105° C. will be computed on the basis of the soap as received, but all other constituents will be calculated on the basis of material containing 34 per cent of volatile matter.

Powdered Laundry Soap (P-S-596)

Powdered soap for laundry use shall be a soap in powdered form made from soda and fats, without rosin, as free as possible from water and all substances other than true soap, of a light uniform color, free from disagreeable odor, and suitable for high-grade laundry work with soft water, when the presence of alkaline salts is objectionable.

Matter volatile at 105° C. shall not exceed 7 per cent. Deliveries which yield more than 7 per cent of matter volatile at 105° C. will be rejected without further test. The sum of free alkali, total matter insoluble in alcohol, and sodium chloride shall not exceed 3 per cent. Free alkali, calculated as sodium hydroxide (NaOH), shall not exceed 0.5 per cent. Matter insoluble in water shall not exceed 0.4 per cent. Titer of the mixed fatty acids prepared from the soap shall be not less than 39° C. Residue retained on a No. 12 sieve shall not exceed 1.5 per cent. The percentage of matter volatile at 105° C. will be computed on the basis of the soap as received, but all other constituents will be calculated on the basis of material containing 5 per cent of volatile matter.

Soap Powder (P-S-606)

Soap powder shall be a uniform mixture of soap and sodium carbonate in powdered form. It shall be readily soluble in tepid water, shall contain no free caustic alkali or inert filler, and shall be free from objectionable odor.

Anhydrous soap shall be not less than 15 per cent. Sodium carbonate (Na_2CO_3) shall be not less than 30 per cent. The aggregate of anhydrous soap and sodium carbonate shall be not less than 55 per cent.

Salt-Water Soap (P-S-611)

Salt-water soap shall be a soap well made from pure coconut oil, pure palm kernel oil, or a mixture thereof, and the necessary alkali. It shall be entirely soluble in both sea water and fresh water and shall make a suitable lather.

Matter volatile at 105° C. shall not exceed 55 per cent. Deliveries which yield more than 55 per cent of volatile matter will be rejected without further test. Total matter insoluble in alcohol shall be not less than 2 per cent nor more than 3 per cent and shall consist, essentially, of sodium carbonate (Na_2CO_3). Free alkali, calculated as sodium hydroxide (NaOH), shall not exceed 0.5 per cent. Matter insoluble in water shall not exceed 0.5 per cent. Chloride, calculated as sodium chloride (NaCl), shall be not less than 2.5 per cent nor more than 3.5

per cent. Rosin, sugar, and foreign matter shall not be present. The acid number of the mixed fatty acids prepared from the soap shall be not less than 240. The percentage of matter volatile at 105° C. will be computed on the basis of the soap as received, but all other constituents will be calculated on the basis of material containing 55 per cent of volatile matter.

White Floating Toilet Soap (P-S-616)

White, floating soap shall be a cake soap, at least as good in every respect as one made from soda and a mixture of high-grade tallow with 25 to 30 per cent of coconut oil, of good light color, without objectionable odor, thoroughly saponified, and so prepared as to float on water.

Matter volatile at 105° C. shall not exceed 34 per cent. Deliveries which yield more than 34 per cent volatile matter will be rejected without further test. The sum of free alkali, total matter insoluble in alcohol, and sodium chloride shall not exceed 2.0 per cent. Free alkali, calculated as sodium hydroxide (NaOH), shall not exceed 0.15 per cent. Chloride, calculated as sodium chloride (NaCl), shall not exceed 1 per cent. Matter insoluble in water shall not exceed 0.2 per cent. Rosin, sugar, and foreign matter shall not be present. The acid number of the mixed fatty acids prepared from the soap shall be not less than 212. The percentage of matter volatile at 105° C. will be computed on the basis of the soap as received, but all other constituents will be calculated on the basis of material containing 28 per cent of volatile matter.

Liquid Toilet Soap (P-S-618)

Liquid toilet soap shall be a clear solution of pure vegetable oil potash (or potash and soda) soap with or without glycerol or alcohol, suitably perfumed, and free from all foreign matter. It shall quickly form a satisfactory lather and have no injurious effect and leave no objectionable odor on the skin.

The material shall be a clear solution, free from objectionable odor, other than from coconut oil, and shall form a satisfactory lather. Total anhydrous soap shall be not less than the equivalent of 15 per cent potash soap. Total matter insoluble in alcohol shall not exceed 0.5 per cent. Free alkali calculated as potassium hydroxide (KOH) shall not exceed 0.05 per cent. Chloride calculated as potassium chloride (KCl) shall not exceed 0.3 per cent. More than traces of sulphates and sugar shall not be present. All constituents shall be calculated on the basis of the original sample.

Milled Toilet Soap (P-S-621)

Milled toilet soap shall be a high grade, milled cake soap, as free as possible from water, either colored or uncolored, and mildly perfumed unless otherwise specified, thoroughly saponified, well compressed in firm, smooth cakes of a size and shape specified in the contract. It should lather freely when used with cold, soft, water.

Matter volatile at 105° C. shall not exceed 15 per cent. Deliveries which yield more than 15 per cent of volatile matter will be rejected without further test. The sum of free alkali, total matter insoluble in alcohol, and sodium chloride shall not exceed 1.5 per cent. Free alkali, calculated as sodium hydroxide (NaOH), shall not exceed 0.1 per cent. Matter insoluble in water shall not exceed 0.2 per cent. Unsaponified saponifiable matter shall not exceed 0.3 per cent. Rosin, sugar, and foreign matter shall not be present. The percentage of matter volatile at 105° C. will be computed on the basis of the soap as received, but all other constituents will be calculated on the basis of material containing 15 per cent of matter volatile at 105° C.

Caustic Soda for Cleaning (P-S-631)

Caustic soda shall be furnished in flake, coarsely powdered, or granular form, as specified by the purchaser. It shall contain not less than 90 per cent sodium hydroxide (NaOH) and not more than 4 per cent carbonate, calculated as sodium carbonate (Na_2CO_3).

Laundry Soda, (Washing Soda), (P-S-641)

Laundry soda shall be a white uniform powder composed of sodium carbonate and sodium bicarbonate. Total alkalinity, calculated as Na_2O , shall be not less than 39 per cent or more than 41 per cent. Matter insoluble in water shall not exceed 0.1 per cent.

Mechanics' Hand Detergent (P-D-221)

Detergent for mechanics' use shall be of the following types, as specified: Type I—hand grit paste soap; Type II—hand scouring powder. It shall be a uniform mixture in paste or powder form, as specified, and shall be satisfactory for removing oil, grease, paint, printing inks, and other occupational soil from the hands of automobile mechanics, machinists, and other operatives without harmful effect on the skin.

Type I—(Hand grit paste soap).

The material shall be a uniform paste. The odor shall not be objectionable. If desired, shall conform to the odor of a sample mutually agreed upon by buyer and seller. The mutually agreed upon sample shall be kept in an air-

tight, closed container for comparison with samples from deliveries. Volatile matter at 105° to 110° C. shall not exceed 55 per cent. Deliveries which yield more than 55 per cent of volatile matter shall be rejected without further test. Alkaline salts, calculated as sodium carbonate (Na_2CO_3), shall not be more than 2 per cent. Free alkali, calculated as sodium hydroxide (NaOH), shall not exceed 0.02 per cent. Free acid, calculated as oleic acid, shall not exceed 0.2 per cent. Anhydrous soap, calculated as soda soap, shall be not less than 8 per cent nor more than 16 per cent. Insoluble siliceous matter shall be not less than 25 per cent nor more than 50 per cent and shall conform to the following fineness requirements:

Retained on—	Minimum Percent	Maximum Percent
No. 40 sieve	—	0
No. 60 sieve	10	20
No. 80 sieve	30	45
No. 100 sieve	35	55
No. 200 sieve	60	—

The material shall retain the consistency of a firm paste after keeping in a closed container for 6 hours at 30° to 32° C. (86° to 89.6° F.). The material shall not deteriorate when kept in an airtight container. The percentage of matter volatile at 105° to 110° C. will be computed on the basis of the grit paste soap as received, but all other constituents will be calculated on the basis of material containing 50 per cent of matter volatile at 105° to 110° C.

Type II—(Hand scouring powder).

The material shall be a uniform, free-flowing powder. The odor shall not be objectionable. If desired, shall conform to the odor of a sample mutually agreed upon by buyer and seller. The mutually agreed upon sample shall be kept in an airtight, closed container for comparison with samples from deliveries. Volatile matter at 105° to 110° C. shall not exceed 5 per cent. Deliveries which yield more than 5 per cent of volatile matter shall be rejected without further test. Alkaline salts, calculated as sodium carbonate (Na_2CO_3), shall be not less than 2 per cent nor more than 5 per cent. The alkaline salts shall consist of borax, sodium carbonate or a mixture thereof. Free alkali, calculated as sodium hydroxide (NaOH), shall not exceed 0.1 per cent. Free acid, calculated as oleic acid, shall not exceed 0.2 per cent. Anhydrous soap, calculated as soda soap, shall be not less than 17 per cent. Insoluble siliceous matter shall be not less than 60 per cent nor more than 76 per cent and shall conform to the following fineness requirements:

Retained on—	Maximum Percent
No. 60 sieve	5
No. 100 sieve	30
No. 200 sieve	60

Rosin or sugar shall not be present. All constituents shall be reported on the basis of the sample as received.

Sweeping Compound (P-C-591)

Sweeping compound shall consist of a uniform mixture of the materials as specified for each type and shall be artificially colored or uncolored as specified by the purchaser. If desired, shall conform to the color of a sample mutually agreed upon by buyer and seller.

Type I—(Mineral-oil compound).

Odor shall not be objectionable. If desired shall conform to the odor of a sample mutually agreed upon by buyer and seller. The mutually agreed upon sample shall be kept in an airtight, closed container for comparison with samples from deliveries. The material shall, on use, not stain flooring or adjacent surfaces. The material shall not give off flammable vapors when tested according to section F-2b. Material not meeting the test for flammable vapors will be rejected without further test. Water (matter volatile at 105-110° C.) shall be not more than 10 per cent by weight. Refined mineral oil (such as paraffin oil) shall be not less than 15 per cent and not more than 20 per cent by weight. Clean, fine, sharp sand or feldspar sand shall be not less than 35 per cent and not more than 50 per cent by weight. Not more than 1 per cent of sand shall be retained on a No. 20 sieve when tested according to section F-2j. Fatty oils shall not be present. The remainder shall be finely ground sawdust. Not more than 1 per cent of sawdust shall be retained on a No. 8 sieve when tested according to section F-2j.

Type II—(Water-wax-emulsion compound)

Odor shall not be objectionable. If desired shall conform to the odor of a sample mutually agreed upon by buyer and seller. The mutually agreed upon sample shall be kept in an airtight, closed container for comparison with samples from deliveries. The material shall not stain flooring surfaces on which it may be used. The material shall not give off flammable vapors when tested according to section F-2b. Material not meeting the test for flammable vapors will be rejected without further test. Water (matter volatile at 105-110° C.) shall be not more than 12 per cent by weight. Clean, fine, sharp sand, or feldspar sand shall be not less than 60 per cent and not more than 70 per cent by weight. Not more than 1 per cent of sand shall be re-

tained on a No. 20 sieve when tested according to section F-2j. Finely ground sawdust shall be not less than 5 per cent and not more than 10 per cent by weight. Not more than 1 per cent of sawdust shall be retained on a No. 8 sieve when tested according to section F-2j. The remainder shall be waxes and emulsifying agents.

Paste Metal Polish (P-P-556)

Polishing paste shall consist of a uniformly mixed paste of such a consistency as to be easily applied. It shall be free from disagreeable odor and shall have good cleansing and polishing properties. It shall be free from acid, cyanides, or other ingredients having injurious effect upon metal, and shall not scratch metal.

Silver Polish (P-P-571)

Silver polish, types A, (liquid), and B, (paste), shall consist of finely ground, white, diatomaceous or infusorial earth, suitably compounded with a neutral soap. Silver polish, type C, (powder), shall consist solely of finely ground, white, diatomaceous or infusorial earth, free from adulterants or foreign matter. Types A and B shall be free from acids or cyanides. All types of silver polish shall have good cleansing and polishing properties and shall contain abrasives of such fineness that 100 per cent will pass through a standard No. 200 sieve.

Stove Polish (P-P-576)

Stove polish shall produce a deep, lustrous black color when applied as directed by the manufacturer. It shall produce no odors upon burning and shall produce a durable coating that will not readily be burned off.

Type I—Polish, stove, liquid, shall be of such consistency that the addition of a fluid will not be necessary in order to make it free-flowing. The vehicle of the polish shall be a non-flammable liquid.

Type II—Polish, stove, paste, shall be non-flammable and shall be of such consistency that it can be readily applied.

Type III—Polish, stove, powder, shall readily form a paste with water, and shall be non-flammable.

Type IV—Polish, stove, cake, shall readily disintegrate in water and form a paste and shall be non-flammable.

Scouring Powder for Floors (P-P-591)

Scouring powder for floors shall be of the following types, as specified: Type A—for fine marble floors; Type B—for tile or ceramic and terazzo floors; Type C—soap scouring compound.

Type A—(For fine marble floors).

Matter volatile at 105° to 110° C. shall not exceed 10 per cent. Deliveries which yield

more than 10 per cent of volatile matter shall be rejected without further test. The sum of sodium carbonate (Na_2CO_3) and anhydrous soap shall not exceed 7 per cent nor be less than 2 per cent. Free alkali, calculated as sodium hydroxide (NaOH) shall not exceed 0.1 per cent. Insoluble siliceous material shall be not less than 85 per cent nor more than 95 per cent. All of the insoluble siliceous material shall pass through a No. 100 sieve, and the residue retained on a No. 200 sieve shall not exceed 5 per cent. The material shall not scratch nor discolor marble. The material shall be a uniform powder, shall be unscented, and shall be of a light gray or white color.

Type B—(For tile or ceramic and terrazzo floors).

Matter volatile at 105° to 110° C. shall not exceed 10 per cent. Deliveries which yield more than 10 per cent of volatile matter shall be rejected without further test. The sum of sodium carbonate (Na_2CO_3) and anhydrous soap shall not be less than 2 per cent. Free alkali, calculated as sodium hydroxide (NaOH), shall not exceed 0.1 per cent. Insoluble siliceous material shall be not less than 80 per cent nor more than 95 per cent. The insoluble siliceous material shall not yield more than 1 per cent of residue retained on a No. 60 sieve and not more than 10 per cent of residue retained on a No. 80 sieve. The material shall be a uniform powder, shall be unscented, and shall be of a light-gray or white color.

Type C—(Soap scouring compound).

Matter volatile at 105° to 110° C. shall not exceed 6 per cent. Deliveries which yield more than 6 per cent of volatile matter shall be rejected without further test. Carbonated alkali, calculated as sodium carbonate (Na_2CO_3) shall not be less than 6 per cent nor more than 20 per cent. Free alkali, calculated as sodium hydroxide (NaOH), shall not exceed 0.1 per cent. Anhydrous soap shall be not less than 3 per cent nor more than 10 per cent. Insoluble siliceous material shall be not less than 60 per cent nor more than 90 per cent. The insoluble siliceous material shall not yield more than 1 per cent of residue retained on a No. 60 sieve and not more than 10 per cent of residue retained on a No. 80 sieve. The material shall be a uniform powder, shall be unscented, and shall be light-gray or white in color.

Scouring Powder for Glass (P-P-596)

Shall be a fine, uniform powder, and shall be suitable for cleaning highly polished glass surfaces which must transmit light efficiently, such as cabin windows and windshields of aircraft.

The material shall clean glass surfaces satisfactorily without scratching the glass or leaving an oily or other film on the surface. The material shall be a uniform, free-flowing powder, shall be scented or unscented, and shall be white or light gray in color. Matter volatile at 105° to 110° C. shall not exceed 4 per cent. Deliveries which yield more than 4 per cent of volatile matter shall be rejected without further test. Alkali as alkaline salts (total alkalinity of matter insoluble in alcohol), calculated as sodium carbonate (Na_2CO_3), shall not exceed 5 per cent. Free alkali, calculated as sodium hydroxide (NaOH), shall not exceed 0.1 per cent. Insoluble siliceous material shall be not less than 85 per cent nor more than 93 per cent, and shall consist of ground feldspar or other insoluble siliceous abrasive that will not scratch highly polished glass surfaces. All of the insoluble siliceous material shall pass through a No. 100 sieve, and the residue retained on a No. 200 sieve shall not exceed 5 per cent. Rosin, sugar, and foreign matter shall not be present. Anhydrous soda soap shall be not less than 4 per cent and shall be within 1 per cent of the difference between 100 and the sum of the matter volatile at 105° to 110° C., insoluble siliceous material, and alkali as alkaline salts.

Technical Trisodium Phosphate (O-T-671)

Technical trisodium phosphate shall be a white, uniform product in finely granulated form, and shall contain not less than 95 per cent of crystalline trisodium phosphate ($\text{Na}_3\text{PO}_4 \cdot 12\text{H}_2\text{O}$).

It shall be a white, uniform, finely granulated product. Total alkalinity to methyl orange indicator, calculated as Na_2O , shall be not less than 15.5 per cent or more than 20 per cent. Phosphoric anhydride (P_2O_5) shall be not less than 17.7 per cent. Matter insoluble in distilled water shall not exceed 0.1 per cent. No residue shall be retained on a No. 10 sieve (sieve opening=0.0787 inch) and the residue retained on a No. 100 sieve (sieve opening=0.0059 inch) shall be not less than 50 per cent.

Soda Ash (O-S-571)

Soda-ash shall be of two grades as specified: Grade A—58 per cent ordinary (or light); Grade B—58 per cent dense.

Soda-ash shall be the high grade anhydrous sodium carbonate in powdered form and shall be the grade specified by the purchaser. It shall conform to the following requirements:

Total alkalinity of the material after drying for one hour at 150° to 155° C. shall be not less than 58 per cent calculated as Na_2O ;

equivalent to 99.2 per cent of sodium carbonate (Na_2CO_3). Hydroxide (NaOH), after drying the material for one hour at 150° to 155° C. shall not exceed 0.1 per cent. Bicarbonate, after drying the material for one hour at 150° to 155° C., shall not exceed 0.5 per cent. Matter insoluble in water, after drying the material for one hour at 150° to 155° C., shall not exceed 0.25 per cent. The total sulphur calculated as sodium sulphide (Na_2S), after drying the material for one hour at 150° to 155° C., shall not exceed 0.1 per cent. Loss in weight on heating the material as received at 150° to 155° C. for one hour shall not exceed 1 per cent.

Grade A—Thirty grams of the light soda-ash (grade A) as received shall have a volume of from 55 to 65 milliliters.

Grade B—Thirty grams of the dense soda-ash (grade B) as received shall have a volume of from 30 to 40 milliliters.

Sodium Cyanide (O-S-591)

Sodium Cyanide shall be a high-grade cyanide of sodium, practically free from sodium chloride and other impurities that would interfere with the liberation of hydrocyanic-acid gas generated by the usual method of treatment with sulfuric acid. It shall contain not less than 96 per cent of actual sodium cyanide (NaCN) equivalent to 51 per cent cyanogen (CN). It shall not contain chlorides in excess of 0.5 per cent expressed as sodium chloride (NaCl). It shall be practically free from iron and the residue after treatment with sulfuric acid to generate hydrocyanic acid shall be completely soluble in water.

Unless otherwise specified, the sodium cyanide delivered under this specification shall be in the form of balls or pieces weighing from $\frac{1}{2}$ ounce to 4 ounces each.

Sodium Fluoride (O-S-601)

Sodium fluoride shall be a good grade commercial product in the form of a uniform, fine, dry, white powder, suitable for dusting, free from lumps or gritty material and practically free from matter insoluble in water. It shall contain not less than 90 per cent of sodium fluoride, NaF , the remaining 10 per cent to consist of the usual impurities in a good grade of commercial sodium fluoride, such as sodium silico-fluoride, sodium bifluoride, sodium carbonate, sodium chloride, sodium sulfate, etc.

Insect Powder (O-P-571)

Insect powder shall consist of the powdered flower heads of *Chrysanthemum* (*Pyrethrum*) *cinerariaefolium* (Trev. Bocc.). It shall be a product resulting from the reduction to an impalpable powder of insect flower heads of the species named and free from added stems and other adulterants. It shall be made of flowers that have been properly harvested and cured so as to retain the maximum insecticidal efficiency and are free from mold, and the powder shall have the characteristic color and odor. It shall not contain insect flower stems in excess of the amount occurring attached to flowers as harvested, and in no case in excess of 5 per cent. It shall not contain more than 2 per cent of ash insoluble in dilute hydrochloric acid.



Testing Liquid Insecticides

*Official Peet-Grady Method of
National Association of Insecticide & Disinfectant Manufacturers
with Minimum Standard and Oil Specifications*

THE minimum standard for general liquid household spray insecticides, and the official Peet-Grady Method for testing such insecticides, as adopted by the National Association of Insecticide & Disinfectant Manufacturers, is published herewith in detail. Specifications for the Pennsylvania oil designated for testing the comparative resistance of house flies bred in one laboratory as compared with those bred in another, are also given.

The exact wording of the minimum insecticide standard as adopted by the Association is as follows: "The members of the National Association of Insecticide & Disinfectant Manufacturers agree that a minimum standard for a general household liquid spray insecticide should be 95% down ten minutes after spraying, and at least 60% kill, twenty-four hours after spraying, as determined by the Peet-Grady Method on house flies. In addition, the liquid base should exceed 120 deg. F. in flashpoint as determined by the Tagliabue open cup method, and should not be referred to as kerosene, kerosene petroleum, or petroleum insecticide base in the future, but as a hydrocarbon distillate base. These tests shall be conducted at a temperature of 85 deg. F. and 60 to 70% relative humidity. To compare the resistance of flies used in one laboratory to those used in another laboratory, this method will be followed out using ordinary kerosene as originating in the Pennsylvania field. Per cent knock down and per cent kill by this oil will be set forth in the complete specification. The flies used in this test shall be five days old."

THE PEET-GRADY METHOD

A Biological Method for the Determination of the Effectiveness of Household Insecticides

This paper is a revision of the original papers from the Research Laboratories of the Röhm and Haas Co., Inc. by C. H. Peet and A. G. Grady, ("Journal of Economic Entomology," vol. 21, pgs. 598-625, August, 1928)

THE STANDARD

The official minimum standard of the National Association of Insecticide & Disinfectant Manufacturers for general household liquid spray insecticides, as recommended by the Insecticide Committee and adopted by the Association, is as follows:

By Peet-Grady Method on house flies—

Down in ten minutes.....95%

Dead in 24 hours.....60%

Age of test flies.....5 days

Temperature of chamber.....85 F.

Relative Humidity of
chamber60-70%

Flashpoint.....Not less than 120 F.
(Tagliabue Open Cup)

prepared under the supervision of the Insecticide Standardization Committee as a part of the standardization program of the National Association of Insecticide & Disinfectant Manufacturers.

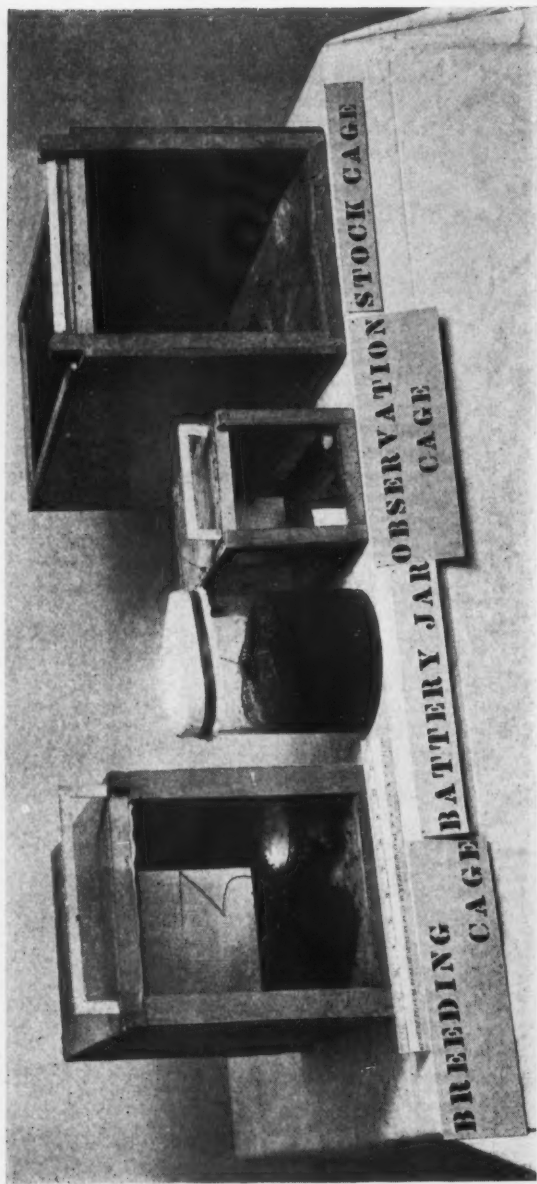
THIS paper details a successful method evolved whereby large numbers of house flies can be reared through the whole year. The technic employed is simple, inexpensive and dependable. Full credit for the continuous breeding of this insect should be given to Glaser¹ who conceived the idea of supplementing the larval medium with yeast cells suspended in water during the winter months.

The literature on the biology of *Musca domestica* has assumed extensive proportions and it is not the intention of the writers to deal with it except to note some observations on the activity and longevity of the imagines during the winter months.

The larvae were reared throughout the winter on a medium consisting of fresh horse manure which was kept in a moist condition with water and yeast cells suspended in water, according to Glaser's method. Excellent results were obtained. Attempts were made

¹ Note on the continuous Breeding of *Musca domestica* Journ. Econ. Ent., 1927, XX, 432-433.

The Required Fly-Breeding Equipment for the Peet-Grady Method.



Left—Maggots of the House Fly in Larval Stage.

Right—Eggs of House Fly Magnified many times.



during the latter half of January and during the month of February to rear flies on horse manure alone. In every case, except two, the insects died either in the larval or pupal stages. In the two successful attempts the horse manure was taken from the stables during a warm spell. Whether this had anything to do with carrying the larvae through to the adult stage was not determined.

From these experiences and the experiences of other investigators it was concluded that unless the horse manure was supplemented during the winter months larval life could not be supported and a continuous supply of insects could not be maintained.

The adult insects thrived exceedingly well on a diet consisting of milk, lump sugar, sweetened bread and yeast suspended in water. About 10 cc. of milk was dropped into the cages every day and about the same amount of yeast suspension was fed every second day. Fresh sweetened bread was placed in the cages about once a week. The bread was kept in an assimilable condition by wetting it with water. Other foods were added to this diet at different times such as beef extract, casein and fish-scrap. However, the adults developed sufficiently well on milk, bread, sugar and yeast so that the strictly protein foods were not used as regular parts of the diet.

The apparatus and equipment used to rear the house flies throughout the winter months were as follows: A constant temperature insectary where the breeding cages, rearing jars and stock cages were kept; breeding cages in which the insects were bred and oviposition took place; rearing jars in which the insect was reared from the egg to the adult stage; and finally, stock cages where the flies to be used for insecticidal tests were kept.

Insectary

A ROOM 12 feet long, 11 feet wide and 9 feet high was thoroughly insulated with "balsam wool." One end and one side wall contained double windows which were lightly sprayed with whitewash. The entrance door was in one corner. Shelves lined three of the walls and a rack of shelves was built in the center of the room. The heating element consisted of four 1 inch steam pipes totaling 72 feet in length running along the inside of the two outside walls of the chamber. A Sarco heat regulator was used to control the temperature of the heating unit.

Electricity may be substituted for steam in heating the room if it is considered more desirable. Excellent temperature control can be obtained by using a unit similar to that manufactured by the General Electric Co., Catalogue No. 2829653 G-3, CR 7002, 110 volt.

A cooling unit consisting of an Aerofin radiator containing 300 feet of $\frac{3}{4}$ inch, finned radiation was suspended in the center of the room from the ceiling and connected to a cold water supply (this water was about 50 to 55° F. summer and winter). A Siphon thermostatic valve controlled the flow of water through the cooling unit and a drip pan suspended beneath the cooling unit caught the condensate which collected on the cooling coils and delivered it by a drain to a sewer line. The temperature regulators were set at 85° F. and a Brown Recording Thermometer showed that the system thus installed was capable of holding the temperature of the insectary to 85° F. $\pm 1^\circ$.

The humidifier described in the original paper was later eliminated since it was found that the moisture of the culture medium in the rearing jars kept the humidity of the chamber at about 70%. Strict control could not be obtained without recourse to very elaborate equipment.

Breeding Cages

BECAUSE flies are susceptible to nutritional deficiency diseases and to attacks of parasites and parasitic fungi it was found best to keep the insects used for breeding purposes in relatively small separate cages so that if one colony of breeders became infected the disease could be checked before it spread to the other cages. As a result of this precaution, no high mortality occurred among the flies in the breeding cages that could be laid to a diseased condition.

As it was desired to have on hand hundreds of flies of known ages at all times, six breeding cages were used. Their dimensions were: length, 18 inches; breadth, 9 inches; height, 10 inches. The floor was made of a board $\frac{1}{2}$ inch thick to which the frame was attached. The frame was constructed of $\frac{3}{4}$ inch strips. The upright strips were nailed to the floor of the cage and connected by $\frac{1}{4}$ inch crosspieces. The sides, top and back were made of wire fly screening, (1/16 inch mesh) tacked to the frame. The front was a piece of glass set in grooves which served as a door. These cages are easy to clean, provide plenty of room for the insects to move about and access to the inside is gained easily by pushing up the glass door to introduce food and insects.

Rearing Jars

ORDINARY battery jars 6 inches in diameter by eight inches high were used for rearing the larvae. These jars were closed by pieces of cheesecloth about 9 inches in diameter which were held in place by $\frac{3}{4}$ inch elastic "garters." This type of top is inexpensive, easily made, gives entirely adequate ventilation, and will serve for a number of generation of flies.

Stock Cages

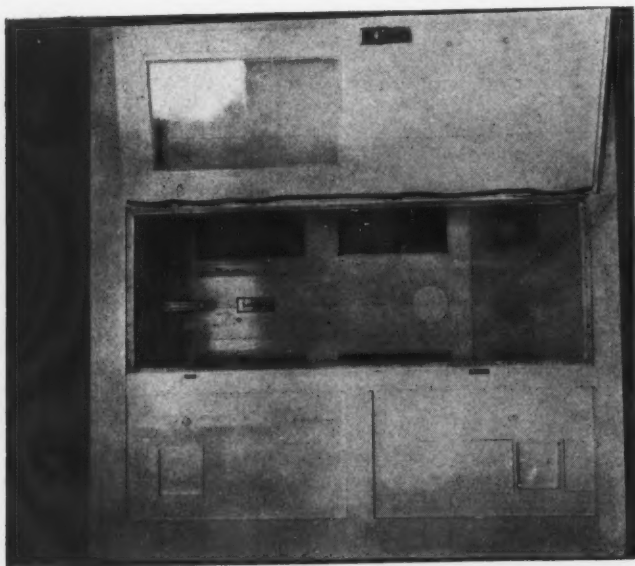
VARIOUS efforts were made to develop cages which would allow automatic or semi-automatic transfer of flies from the rearing jars but none proved very successful and ultimately the same type of cage was adopted as were used for breeding cages. These cages were numbered in order that the age of the flies contained therein might be recorded.

Since flies were not used for insecticide tests after they were 5 days old, only five cages were necessary for a series but when large numbers of flies are being bred, it becomes necessary to have duplicate series of cages in order that overcrowding of the cages may be avoided.

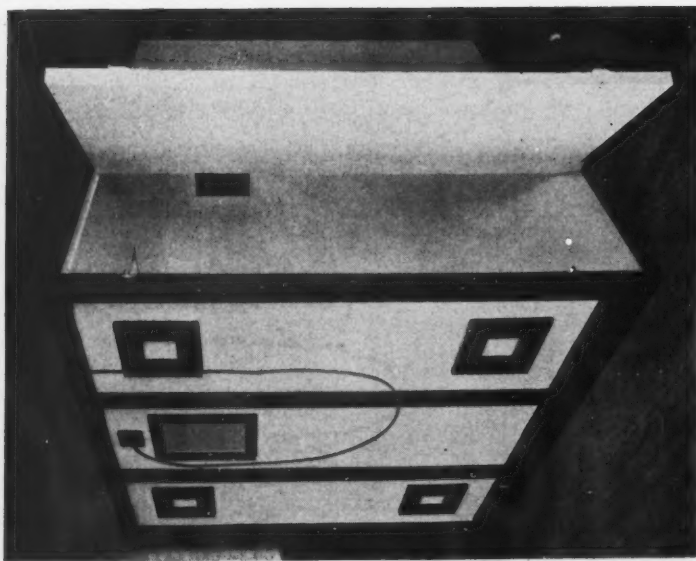
Transfer of the flies from rearing jars to stock cages is accomplished by lifting the glass slide of the cage, inserting the covered end of the rearing jar, slipping off the cheesecloth cover, tapping the jar, withdrawing the jar, closing the glass slide and replacing the cheesecloth cover.

Procedure

IN each of the breeding cages about two hundred adult flies, about equally divided as to sex, were kept. When the insects died or became unduly soiled or injured they were replaced by others. Two 200 cc. beakers filled with wet horse manure were placed in each cage for the flies to oviposit on. In the course of two days hundreds of eggs were deposited on the medium. Every day the beakers containing eggs and larvae were removed. Other beakers filled with fresh horse manure, to which about 15 cc. of water had been added, were then placed in the breeding cages. In this way fresh medium was kept in the breeding cages continually for the flies to oviposit on. It appears that this part of the technic stimulated the responses of the females in regard to oviposition and aided some-



View of the interior of the Peet-Grady Chamber, showing temperature and humidity control, and large pipe at top for rapid exhausting of the air following each test.



Exterior View of the standard Peet-Grady Test Chamber, which is a six foot cube.

what in keeping the flies from laying eggs on the adult food, i.e., the sweetened bread.

To insure a large supply of adults, several cultures were started each day. About five or six hundred eggs and larvae, obtained as above, were transferred to each of the rearing jars. Each jar was filled to about the three-fourths mark with fresh, loosely packed horse manure. It was found that if about 200 cc. of water was added to the manure when the culture was started it was sufficient to keep the medium in a moist condition until the adults emerged. The losses resulting from larvae drowning were insignificant. To this 75 cc. of the supplementary food, yeast cells suspended in water, was added and about 10 cc. more was dropped in the jars every other day until the larvae were about ready to pupate. The amount of yeast to be fed varies, of course, with the number of larvae to be reared. It was found that in this case if the amount of yeast suspension was cut down the adults, if they emerged, were apt to be stunted and possess little vitality.

In making up the yeast suspension Glaser advises, "In practice we dissolve a one pound bakery cake of commercial yeast in two liters of water. The suspension of yeast cells is then distributed in pint bottles and autoclaved, to kill fungi which often cause trouble, and stored on ice." We have found that if one pound of yeast is dissolved in two and one half or three liters of water, very good results can be obtained. At first the yeast suspension was autoclaved using pint milk bottles as receptacles. A pyrex flask was later substituted for the milk bottles as these are apt to crack when subjected to high temperatures a few times. A number of cultures were reared using yeast suspension which was not autoclaved. While this part of the technic may be left out, with little or no difference in the results, it is advisable to sterilize the yeast suspension if an autoclave is available.

The horse manure containing eggs and larvae was then emptied onto the fresh medium, the covers fitted on the jars and the culture was incubated at 85° F. The larval medium settled in a few days to about the middle of the jar which gave the adults plenty of room to move about when they emerged.

At this temperature the time required from egg to adult was approximately eleven days. Some of the adults emerged nine days after being placed in the rearing jars and the rest within eleven days. As the flies emerged they were transferred from the rearing jars as previously described and either placed in a stock cage to be held for insecticidal tests or used for breeding purposes. It is advisable to take the flies out of the rearing jars soon after they emerge so as to avoid overcrowding. When large numbers of adults are allowed to stay in the rearing jars they are apt to become excited and mill about the top of the jars in an effort to escape. This often results in a high mortality.

To draw any conclusions from insecticidal tests which would shed light on the toxicity of a compound, the age and the condition of the insects used should be known. This appears to be particularly true of flies. We have found that the adult house fly bred under artificial conditions during the winter months is most active and resistant when it is four to five days old. In comparing results of insecticidal tests run during the summer with wild flies and those reared artificially it developed that winter flies, four or five days old, were more uniformly resistant to toxic compounds than wild summer flies and fully as resistant as controlled cultures developed during the summer. *As the age of the flies was of great importance they were kept in separate cages dependent on the date they emerged.*

After the fifth day flies which had not been used for insecticidal tests or transferred to the breeding cages

THE OIL SPECIFICATION

The Pennsylvania oil, adopted as standard by the National Association of Insecticide & Disinfectant Manufacturers for testing the relative resistance of flies bred in one laboratory as compared with those bred in another, shall have the specifications as listed below:

A. P. I. Gravity.....	49-50
Flash Point.....	Above 120 F.
Initial Boiling Point.....	Above 350 F.
End Point.....	Not Above 510 F.
Saybolt Color.....	30 Plus
Odor.....	Slight
Iodine Number, Hanus.....	Below 1

Such an oil when used without additions by the Peet-Grady Method against house flies should not give more than 20% down and 6% kill. House flies showing these average results shall be considered to have standard resistance to the action of liquid spray insecticides.

were killed. The cage was then thoroughly washed with soap and water and dried. As the adults were continually emerging in the rearing jars it was necessary to use the cage immediately for a new supply. In this way a continuous cycle was maintained with a minimum number of cages.

When flies were needed for insecticidal tests, the stock cage was taken to the testing chamber, the slide was raised slightly until the desired number of insects had escaped into the chamber, the slide was then lowered and the door of the chamber was closed.

Observations

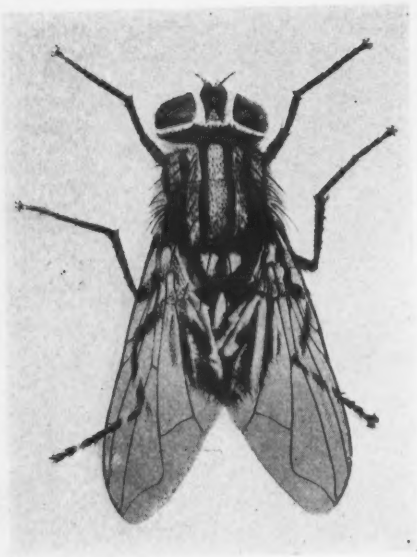
A FEW observations on the activity and longevity of the adults during the winter months were made. It was found that the adult fly was very active and resistant until about the eighth day after it emerged, reaching what might be called its peak of activity and resistance about the fifth day. The longevity of the adult varied from two to thirty-three days with an arithmetical mean of thirteen plus days. It was also noted that the ovaries and testes developed rapidly and in some cases eggs were deposited by the flies in a little over three days after the time of emergence. Some investigators² have reported that the life of the adult house fly, reared during the warmer seasons, averages approximately twenty days and that the time required for the development of the ovaries and testes was longer by several days than observed in this case. Whether this comparatively short life cycle and rapid development was due to the fact that the flies were continually subjected to a constant temperature of 85° F., a special diet, absence of direct sunlight, or to other factors was not determined.

General Testing Considerations

ALTHOUGH a vast amount of work has been done on examining various compounds to determine their value as insecticides, the variations in the methods

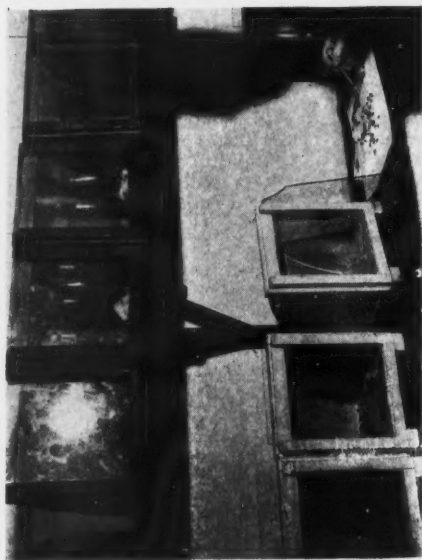
² Howard, House Flies, U. S. Dept. Agri. Farmers' Bulletin, 679, 9115; Glaser, Rearing Flies for Exp. Purposes with Biological Notes, J. Econ. Ent., 1924, XVII, 486-496.

Below — The floor of the Peet-Grady Chamber ten minutes after spraying. These flies are carefully taken up and kept in an observation cage for 24 hours.



The Common House Fly, *Musca Domestica*.

Below—24 hours after the test, the "deads" in the cage are counted. They should show a minimum of 60%.



of testing these compounds and in the standards set up by the various investigators have made it almost impossible to draw valid comparisons between the results reported. In some cases insects have been tested by exposing them to the fumes of the particular compound being tested even though the compounds were relatively non-volatile and had to be heated in order to volatilize them. In others the compound being studied was dissolved in some oil carrier and dispersed by spraying. Still other determinations of insecticidal effectiveness have been made by completely immersing the insect to be tested in the material under consideration either at 100% concentration or at various dilutions. Obviously there is almost no common ground between these methods of testing. The desirability, however, of formulating some uniform testing procedure is evident and it is hoped that this paper will serve to stimulate other investigators to work upon this problem and to offer such alterations and improvements in technique as may seem desirable.

The most common pest the world over is the fly and the economic significance of the various species of stable flies is so well appreciated that a large program of research upon its control is being undertaken by the government. The annoyances caused by the house fly as well as the danger of infection due to its presence are pointed out in the advertisements of every magazine. The smaller and generally less prevalent fruit flies, gnats, etc., constitute a special problem in certain localities. Accordingly this paper deals specifically with methods of determining the effectiveness of compounds against flies. There is, of course, a great variation in the resistance of the different families of flies to the action of insecticides, but the relative resistance of these various families follows approximately the same curve against all insecticidal compounds. Accordingly, once that curve has been established for all the families, which are sufficiently common to constitute pests, it is only necessary, in testing a new compound, to test it against one or two families in order to locate the curve of its efficiency. This paper makes no attempt to establish these curves but serves solely to point out a method of testing which is applicable to all families of flies.

The determination of toxicity against insects must be a purely biological test and, like all biological tests, it is subject to the very considerable variability which accompanies the reaction of the living organism to external effects and influences. This variability is innate in all creatures and cannot be controlled but the superficial variables which have heretofore been ignored, or too little considered, can be so accurately controlled that only the biological variable remains to remove such tests from strict reproducibility and the average will be just as certain as life insurance mortality tables.

The variables which this investigation has shown to possess the greatest significance are: time, temperature, humidity, insecticide concentration, carrier, fineness of spray, air conditions, angle of spray and condition of insect.

It is obvious that it is unfair to draw a comparison between two insecticidal compounds one of which is allowed to work upon the insect for twice as long a time as the other.

The importance of temperature control may easily be demonstrated by exposing two groups of insects from the same brood to the same insecticide at say 60° F. and 85° F. The higher percentage kill among the insects in the warmer chamber will be quickly appreciated.

The influence of humidity on the resistance of the insect to toxic compounds has been generally ignored in testing for insecticidal power. It does not have as great an effect as the temperature differential but it should be considered.

The fact that a higher concentration of material being tested in any given solution should produce a greater or more rapid kill does not require discussion.

The variations in effectiveness produced by variations in spray concentration are less easily demonstrable but undoubtedly just as certain for if the spray or vapor of any material under consideration be more attenuated in one instance than in another, there must be a higher concentration of insecticide in the area which has the greatest spray concentration.

Few carriers are inert but many studies have shown that there is a very considerable difference between the toxicity of these numerous relatively inert solvents.³ Accordingly, if one investigator reports on an insecticide using as a carrier a certain fraction of Pennsylvania Oil, another on the same material using a corresponding fraction of California Oil, there will be a disagreement. Similarly if one investigator uses a certain fraction of Pennsylvania Oil and another a different fraction of the same oil, they will obtain different results.

Griffin, Richardson and Burdette⁴ have shown that the size droplet produced by a sprayer has a very marked effect upon the insecticidal activity of the same material. Droplets of 5 to 10 μ produce about the maximum effect whereas droplets of 2 μ and smaller decrease the activity of the insecticide. These conclusions were based upon a study of contact sprays and insofar as the insecticide serves as a contact poison, they will apply to it. If, on the other hand, the insecticide functions in the vapor phase, the rate of evaporation will increase as the droplet size decreases and the reverse conclusion must be drawn. There are two ways of producing these variations in droplet size. One is by changing the type of atomizer or spray and the other by changing the pressure on the same sprayer. Since it is probable that the majority of tests will be made using the same sprayer, the variable which must be controlled is pressure.

By air conditions is meant whether the air is fresh or exhausted but this factor can probably be ignored because the chamber is always aired between tests.

The importance of the angle of the spray is closely related to spray concentration. If the spray enters the chamber from all directions there is much more uniform dispersion of the material under study. Also, of course, this factor is of importance if the spray comes in contact with the insects. If the material being examined is heavy and is sprayed downward upon the fly it is possible that its wings will shield its body or perhaps it would be more correct to say that if the spray were directed upward against the fly there would be greater likelihood of its coming in contact with the more vital parts of the insect.

Condition of the insect is one of the most important factors to be considered. It requires no elaboration to point out that an old fly or a vitiated fly or a very young fly or a fly in any way enfeebled will be more susceptible to the action of any toxic material than will a strong healthy individual.

The method of testing which this paper wishes to advocate is as follows:

Chamber: All fly tests should be carried out under conditions which at least approximate those existing in the fly's normal environment and for this purpose a chamber of sufficient size to enable the fly to move about freely and approximately as unrestrictedly as it normally would should be provided. A very satisfactory size has been found to be a 6 x 6 x 6 foot cube. In

³ Moore & Graham. A study of the Toxicity of Kerosene, Jour. Econ. Ent., 1918, XI, 70-75.

⁴ Griffin, Richardson & Burdette. Relation of Size of Oil Drops to Toxicity of Petroleum-Oil Emulsions to Aphids. Jour. of Agri. Research, Vol. 34, Pages 727-738.

the studies upon which this paper is based, this chamber was made of wood with the bracing members on the outside, leaving the inside as free from projections, corners, ledges, etc., as possible. The inner surfaces were originally well painted with white enamel in order to prevent absorption, by the wood, of material being tested. This paint, however, adsorbed and absorbed a certain proportion of the oily materials being studied and, although it was carefully wiped out after each test, it was impossible to remove all traces of the preceding materials. Accordingly, the inside, including floor and ceiling, was lined with transite board, an asbestos composition, all corners were sealed with a Sillex-sodium silicate cement and the walls were rendered as nearly non-absorbent to oils as possible by painting with sodium silicate. In the center of the ceiling a glass window was set with a light bulb above it for illumination. A tight closing door, large enough for a man to enter, was set in one wall and the adjoining walls were provided with glass windows in the center of each. These same walls each had four square ports 6 x 6 inches covered with wire gauze and provided with tight fitting hatches. Each wall had two one-half inch holes bored through it six inches from the ceiling and closed by corks.

Procedure: Each test was run upon a considerable number of flies, 5 days of age, never less than 100 and usually rather more but not exceeding about one per cubic foot. These were liberated in the chamber, which was kept at 85° F., and the insecticide was introduced through the one-half inch holes along the ceiling by means of a modified Devilbiss atomizer No. 152 with No. 631 cut-off.

The modification consisted in replacing the reservoir of the atomizer by a narrow 20 cc. cylinder made by cutting off an ordinary burette and sealing one end and in substituting a sufficiently long outlet tube to reach practically to the bottom of the cylinder, for the shorter one which is standard equipment.

By filling the atomizer above the lower end of the outlet tube and spraying until no more spray is delivered when the burette tube is in a vertical position, the zero point of the graduated atomizer is determined. If 12 cc. of insecticide is now added above this zero figure, the atomizer will deliver exactly 12 cc. before it returns to its zero and ceases to deliver. The accuracy of this equipment is about 0.1 cc.

This atomizer was operated at 12½ pounds pressure from a constant pressure airline controlled by a Hoke

reducing valve. The amount of solution used in each test was 12 cc. and this was sprayed in about equal quantities through each top hole. The door and all ports were, of course, tightly closed during this procedure. The chamber was kept closed for ten minutes, during which time observations on the flies could be made through the windows to study the manner in which the material being tested was affecting them. At the end of ten minutes the square ports were all opened, a Buffalo exhaust fan turned on, and the number of flies still clinging to the walls and ceiling was counted through the side windows. The flies which had dropped were carefully gathered up and transferred to clean observation cages in which food and cotton gauze soaked in water had been placed. These cages had wooden bases 6 inches square, wire gauze back and sides and a sliding glass front.

It was considered that the flies still off the floor had escaped the action of the insecticide. The flies in their gauze cages were kept for twenty-four hours to observe whether there was ultimate recovery or death. At the end of this period, these insects were counted and the number still alive added to those which had been on the walls on the chamber. The Buffalo exhaust fan swept out the chamber by sucking air through it and afterward the floor and walls were thoroughly wiped off with an absorbent cloth.

The number of flies still off the floor at the end of the ten minute period divided by the total number liberated in the chamber gives the "knock-down in 10 minutes." The number lying dead in the observation cages after 24 hours divided by the total number originally taken gives the "percentage kill."

The variables thus far held in control are time, temperature, spray concentrations, pressure in spray, air conditions, angle of spray, and kind of insect. The condition of the insect is more particularly dependent upon how it has been bred and this phase of the problem is discussed in the first part of this paper.

Tests conducted following this procedure show a low average variation and it is entirely reasonable to presume that any investigator could obtain very uniform results following the method.

[The helpful criticism of Dr. W. S. Abbott of the U. S. Dept. of Agriculture and the suggestions embodied in the papers of Dr. R. W. Glaser of the Rockefeller Institute for Medical Research as well as his personal assistance were invaluable in the inauguration of this work.]



Estimation of Pyrethrins

By HARVEY A. SEIL, Ph.D.

Seil, Putt & Rusby, Inc.

ALTHOUGH many attempts had been made to determine the active ingredients of pyrethrum, none were successful until Staudinger and Ruzicka¹ reported the results of their thorough investigation in 1924. These authors proved that Pyrethrin I and Pyrethrin II were the active principles of pyrethrum, and established their chemical constitution. They established the fact that the pyrethrins were esters of the same ketonic alcohol pyrethrolon combined with two different acids. Pyrethrin I was the pyrethrolon ester of chrysanthemum monocarboxylic acid and Pyrethrin II the pyrethrolon ester of chrysanthemum dicarboxylic acid.

Several methods for the estimation of the pyrethrins have been published. These can be divided into three classes:

1. Methods depending on the reducing properties of the pyrethrolon.

2. Methods depending on the ketonic group in the pyrethrolon.

3. Methods based on the acids combined with the pyrethrolon.

It is evident that methods falling into classes 1 and 2 can determine only the total pyrethrins present, while those in class 3, by determining both acids, give the amounts of Pyrethrin I and Pyrethrin II present.

The methods of Gnadinger and Corl², and Martin and Tattersfield⁷ fall into class 1, since both depend on the reducing power of pyrethrolon. Staudinger and Harder³, and Tattersfield, Hobson and Gimmingham⁹ developed semicarbazone methods which fall into class 2, since they depend on the ketone group of pyrethrolon. The acid methods of Staudinger and Harder, and Tattersfield, Hobson and Gimmingham fall into class 3 and differentiate the pyrethrins.

If both the pyrethrins were equally toxic, it would be immaterial which method was used for assay, provided it was accurate. However, Staudinger and Ruzicka reported Pyrethrin I to be more toxic than Pyrethrin II; Tattersfield and Hobson² stated that Pyrethrin I is ten times as toxic as Pyrethrin II; Wilcoxson and

Hartzell⁸ also state that Pyrethrin I is decidedly more toxic than Pyrethrin II; Wilson⁴, based on the figures for the concentrations of Pyrethrins I and II and the corresponding kill reported by Wilcoxson and Hartzell, mathematically calculated the relative toxicities of the pyrethrins and reported that Pyrethrin II has a toxicity of only about 7 per cent of that of Pyrethrin I; Gnadinger and Corl² found that Pyrethrin II possesses about 80 per cent the toxicity of Pyrethrin I.

Since the pyrethrins differ markedly in their relative toxicity, an analysis giving the total pyrethrins is not sufficient to give the true activity of a sample. For example, if two samples of pyrethrum flowers assay 1 per cent total pyrethrins, with sample "A" containing 0.40 per cent Pyrethrin I and 0.60 per cent Pyrethrin II, and sample "B" containing 0.46 per cent Pyrethrin I and 0.54 per cent Pyrethrin II, using Wilson's figures we find that sample "B" is 12 per cent stronger than sample "A." The Pyrethrin I content of the flowers gives a better index of their toxicity than total pyrethrins. From the Pyrethrin I content of both flowers, sample "B" is 11.5 per cent stronger than sample "A."

The proposed method is an improvement on the acid methods of Staudinger and Harder, and that of Tattersfield. The time required for an analysis is much shorter, and no special equipment is required. After the flowers have been extracted with petroleum ether, the solvent is evaporated, the residue is saponified with N/2 ethyl alcoholic NaOH for 1 to 2 hours. After the saponification is complete, the alcoholic solution is transferred to a beaker, and the alcohol removed by boiling. Since the pyrethrin acids are not precipitated with barium hydroxide, the fats, resins and inert material are removed by precipitation with barium chloride. In an aliquot of the filtrate the monocarboxylic acid is determined substantially as in the Tattersfield Method. The dicarboxylic acid is determined by direct extraction with ether from a saturated salt solution, eliminating the mechanical extraction with ether, saving at least 19 hours in time.

* Based on a paper read before the Natl. Assn. of Insecticide & Disinfectant Mfrs., New York, Dec., 1933.

The Method

METHOD—12.5 g. of 20-30 mesh powdered flowers are extracted in a Soxhlet extractor with low boiling petroleum ether. After the extraction is complete, the petroleum ether is recovered on a water bath. 10 to 15 c.c. of N/2 ethyl alcoholic NaOH is added and the mixture is refluxed for 1 to 2 hours. The alkaline alcoholic solution is transferred to a 600 c.c. beaker, the flask washed with water, and sufficient water is added to bring the volume of liquid in the beaker to 200 c.c. A few glass beads are added and the alcohol is removed by boiling, care being taken to avoid boiling over due to the soap formed by the saponification. When the volume has been reduced to 150 c.c. the solution is cooled and transferred to a 250 c.c. standard flask, to which about 1 g. of filter-cel has been previously added. The solution is thoroughly mixed to distribute the filter-cel, then 10 c.c. of 10 per cent barium chloride solution is added, made up to the mark with water and thoroughly mixed. After the precipitate has settled, filter through a fluted paper. Transfer 200 c.c. of the clear filtrate to 500 c.c. Erlenmeyer flask, add 1 c.c. of concentrated sulphuric acid which precipitates the excess barium and liberates the chrysanthemum acids. Distil with steam, using a distillation trap and an efficient condenser. Receive the distillate in a 500 c.c. Squibb separatory funnel and distil until the liquid in the flask is between 15 and 20 c.c. The amount in the separatory funnel is usually 250 c.c. Allow the flask containing the dicarboxylic acid to cool.

To the separatory funnel add 50 c.c. of neutral petroleum ether, and shake thoroughly for one minute. After the liquids have separated, draw off the aqueous layer into a second 500 c.c. separatory funnel to which a second 50 c.c. of neutral petroleum ether has been added. Shake for one minute and after the liquids have separated, discard the aqueous layer. Wash the petroleum ether in the first separatory funnel with 10 c.c. of water using the same wash water for the petroleum ether in the second funnel. Repeat with a second wash water of 10 c.c. as before. Combine the petroleum ether extracts. Neutralize 15 c.c. of water containing 1 drop of phenolphthalein indicator solution with N/50 NaOH and add it to the combined petroleum ether solutions and titrate with N/50 NaOH, shaking after each addition until the aqueous layer is just pink. Each c.c. of N/50 NaOH consumed is equal to .0066 g. of Pyrethrin I. The 200 c.c. aliquot taken corresponds to 10 g. of sample. Therefore the number of c.c. consumed times .066 gives the percentage of Pyrethrin I.

The solution containing the dicarboxylic acid is filtered through a gooch crucible. The flask

is washed with a little water. The clear filtrate is made alkaline with bicarbonate of soda and transferred to a separatory funnel. It is washed twice with 15 c.c. of chloroform. Washing the first chloroform extract with water, using the same wash water for the second chloroform wash. Combine the aqueous solutions, acidify strongly with hydrochloric acid, saturate with salt, and extract with 50 c.c. of ether, shaking for about 1 minute. Repeat the extractions with three more portions of ether, using 50 c.c. for the second and 25 c.c. each for the third and fourth extractions. Wash the ether of the first extraction with 10 c.c. of water as before. Repeat with a second wash with 10 c.c. of water as before. Combine the ether solutions. Tap off any water separating, and filter into a flask. Recover the ether on a water bath and dry the residue at 100° C. for 10 minutes. Add 2 c.c. of neutral alcohol, warm gently, then add 20 c.c. of distilled water and heat to dissolve the acid. If a residue remains undissolved, cool and filter through a gooch crucible. Add a drop of phenolphthalein indicator solution and titrate with N/50 NaOH of which 1 c.c. is equivalent to .00374 Pyrethrin II.

Method for Kerosene Extracts

VOLLMAR¹⁰ suggested a method for determining Pyrethrin I in kerosene extracts containing no perfumes. The method just outlined can be applied to kerosene sprays. If the spray contains a perfume which may contain esters which will interfere with the estimation of the pyrethrum acids, the perfume can be removed as follows: 100 c.c. of the ordinary household extract, or less of a concentrate, is placed in a 500 c.c. flask with 50 c.c. of water. The flask is heated and steam passed through until the distillate has no perfume odor. The contents of the flask is cooled and transferred to a separatory funnel, the liquids are allowed to separate and the water tapped off into a second separatory funnel, and washed with 25 c.c. of kerosene. The oil in the first funnel is transferred to a 250 c.c. Erlenmeyer flask. The first funnel is washed with the kerosene in the second, which is then added to the flask. 20 c.c. of N/2 ethyl alcoholic NaOH is added and refluxed on a hot plate for 1 to 2 hours. It is then transferred to a 600 c.c. beaker, washing the flask with water, finally adding enough water to make the aqueous layer measure 200 c.c. A few beads are added and the solution boiled until the aqueous layer is 150 c.c. After cooling, the solution is transferred to a 500 c.c. separatory funnel and the kerosene separated. The alkaline aqueous solution is tapped into a 250 c.c. flask. The kerosene is washed once with 10 c.c. of water which is also added to the flask. One gram of filter-cel is added and an excess of 10 per cent

barium chloride solution, usually 10 c.c. is sufficient. From this point proceed as in the method previously outlined.

If the spray under analysis is not perfumed, 100 c.c. is saponified directly with the alcoholic NaOH, without steam distillation.

Reactions of Chrysanthemum Carboxylic Acids

THE aqueous solutions remaining after the titration of both the acids can be used directly for the qualitative tests. If desired, the alcohol can be removed by boiling. After cooling and rendering just acid with acetic acid, and adding a little filter-cel, the phenolphthalein can be removed by filtration through a gooch crucible. With the usual reagents, the acids give the following reaction.

Reagent	Mono Acid		Di Acid	
10% Solution	Cold	Hot	Cold	Hot
CaCl ₂	—	—	—	—
BaCl ₂	—	—	—	—
AgNO ₃	—	—	—	—
AgNO ₃ +NH ₄ OH	—	—	—	—
ZnCl ₂	—	—	—	—
Pb(C ₂ H ₃ O ₄) ₂	+	+	+	+
CuSO ₄	+	+	+	+
FeCl ₃	+	+	+	+
HgCl ₂	—	Reduction	—	Reduction
Fehling Solution	—	—	—	—
K Mn O ₄	Reduction	Reduction	Reduction	Reduction
Br	Absorbed		Absorbed	

The most characteristic reaction of the chrysanthemum mono carboxylic acid is that with Denigés Reagent, the mercury sulphate reagent of the U. S. P. X.

If an excess of the reagent is added to an aqueous solution of the acid, a faint pink color appears at once, which gradually deepens until similar to an alkaline phenolphthalein color. The color changes to a blue red, then purple and then blue and finally a blue with a bronze tint. On further standing greenish shades develop with the formation of a yellow brown precipitate. These changes are hastened by heating to 60° C. On boiling a brownish precipitate forms. On filtration the solution contains mercurous salts which is shown by the

precipitation of calomel on the addition of hydrochloric acid. This reaction will detect 0.5 mg. in a volume of 10 c.c.

The dicarboxylic acid gives no color changes with the mercury reagent but on long standing or by heating deposits a precipitate similar to that of the mono acid. The filtrate from the precipitate contains mercurous mercury.

TYPICAL ANALYSES

FLOWERS		
Pyrethrin I.	Pyrethrin II.	Total
0.48%	0.60%	1.08%
0.49%	0.54%	1.03%
0.41%	0.49%	.90%
0.40%	0.51%	.91%
0.38%	0.53%	.91%
0.40%	0.59%	.99%
0.30%	0.39%	.69%
0.24%	0.35%	.57%
0.29%	0.37%	.66%
0.46%	0.59%	1.05%
0.50%	0.40%	.90%
0.32%	0.43%	.75%
0.17%	0.24%	.41%
0.04%	0.05%	.09%

EXTRACTS

grams per 100 c.c.:		
0.12	.126	.246
0.57	.80	1.37
2.20	2.45	4.65
1.38	1.38	2.76
.05	.058	.108
.065	.085	.15

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Testing Antiseptics and Disinfectants

Official Method of the Food & Drug Administration, U. S. Dept. of
Agriculture, and the National Assn. of Insecticide & Disinfectant
Mfrs. for the Determination of Phenol Coefficients

By G. L. A. RUEHLE and C. M. BREWER

Insecticide Control, Food & Drug Administration

ALL antiseptics and disinfectants shipped or offered for shipment in interstate commerce or offered for import into or export from the United States are subject to the provisions of the Federal insecticide act, the Federal food and drugs act, or both. In the enforcement of these acts it is necessary to determine the accuracy of the bactericidal and antiseptic claims made for such products. A number of methods have been developed for determining bactericidal effectiveness, but all of them possess certain disadvantages. Of course it is impossible to devise tests which will apply in all cases, but during the past 20 years the Insecticide and Fungicide Board and the Food and Drug Administration have found certain methods to be particularly well adapted to their purposes.

Confusion has arisen from the fact that, in many cases, manufacturers have not used the same methods of testing their products, as a basis for preparing their labels, as those used by the administration. This possibility of misunderstanding would be obviated if the same methods were employed by all, and many manufacturers, recognizing this, have requested information as to methods employed by the Food and Drug Administration. In view of this, it seemed desirable to publish them in a form which would make them generally available.

This circular, therefore, describes briefly the methods usually employed in the insecticide control laboratory for testing official samples of antiseptics and disinfectants. No attempt is made to review the literature of disinfectant testing in detail, but the most important papers relating to the methods here presented are cited.

Determination of Phenol Coefficient¹

There are in general use at the present time three methods of determining the phenol coefficient; the Hygienic Laboratory (H. L.) method (11)², that of Rideal-Walker (R-W) (7), and the method developed by this laboratory. It had been realized for a long time, especially among qualified workers in the field of phenol coefficient testing, that there were numerous handicaps and minor deficiencies to be encountered in the routine manipulation of both the H. L. and R-W methods. Lloyd P. Shippen, formerly bacteriologist of the Insecticide and Fungicide Board, after much experience in the testing of disinfectants, devised a method for obtaining phenol coefficients, utilizing as its basis the best features of the two older tests. Under pressure of a great volume of routine work this method was first put into practice more than 15 years ago and found to be so satisfactory that it has come to be used for testing the

great majority of the germicides now received at the Food and Drug Administration.

George F. Reddish, successor to Doctor Shippen, later published this method under the name, "The R-W modified method" (5).

The procedure of Shippen has been little changed, but the standards for the resistance of the test organisms, *Eberthella typhi* (Schröter) Buchanan,³ and *Staphylococcus aureus* Rosenbach, have been firmly established and provisions for the use of other organisms have been added. The method, as here published, is designated the "Food and Drug Administration phenol coefficient method" or briefly, the "F. D. A. method."

The differences in the three methods are shown in Table 1. (See Next Page.)

There need be very little confusion arising from substituting the F. D. A. method as a test for products previously tested by either the R-W or the H. L. methods. The phenol coefficients of the large number of substances chemically related to phenol (the only type of disinfectants for which the H. L. method is accepted) (11) are, in most cases, practically the same, whether tested by the F. D. A. or the H. L. method. Not only has continued use of the method in this laboratory shown this to be true (2), but collaborative experiments in five other laboratories (unpublished) confirm this fact. In comparing this method with the R-W method, similar results in general are obtained, although a somewhat lower coefficient usually results with coal-tar products having high coefficients. However, the higher results sometimes obtained by the R-W method may be misleading. R-W broth is not well adapted for the optimum growth of the test organism; hence nega-

¹ For the benefit of those unfamiliar with testing disinfectants a brief statement of the principles of determining phenol coefficients is made. The phenol coefficient is a figure expressing the ratio of the killing efficiency of a disinfectant as compared with that of phenol tested under identical conditions. The sample to be tested is diluted and the dilutions arranged in a series of decreasing concentrations (increasing dilutions). To these a specified amount of the test organism if broth culture is added. At the end of fixed periods of time a small portion of the mixture of diluted disinfectant and test organism is transferred to a nutrient culture medium and incubated. No growth in the subculture indicates that the organism has been killed. The greatest dilution (weakest concentration) of the disinfectant killing in a definite time period is divided by the greatest dilution of phenol killing in the same time period. This ratio is the phenol coefficient. It should be noted that the phenol coefficient is not based on a comparison of different time intervals but on a comparison of different concentrations acting for specified time periods.

² Italic numbers in parentheses refer to Literature Cited. Page 166.

³ Throughout this paper the term *Eberthella typhi* is used for *Bacillus typhosus*, in accordance with the nomenclature adopted by the committee on classification of the Society of American Bacteriologists (1).

TABLE 1.—Differences in media and manipulation of the three methods of determining phenol coefficient.

Item	F. D. A. method	R-W method	H. L. method
Composition of medium—	{ Peptone ¹ , 10 gm. _____ { Liebig's beef extract, 5 gm. _____ { Salt, 5 gm. _____ { Water, 1,000 c. c. _____ { Boil 20 minutes. _____	Peptone ² , 20 gm. _____ Liebig's beef extract, 10 gm. _____ Salt, 10 gm. _____ Water, 1,000 c. c. _____ Boil 30 minutes _____	Peptone ¹ , 10 gm. _____ Liebig's beef extract, 3 gm. _____ Salt, 5 gm. _____ Water, 1,000 c. c. _____ Boil 15 minutes. _____
Acidity of medium—	pH 6.8 _____	+1.5. No definite pH _____	Unadjusted but pH between 6.0 and 7.0.
Amount of culture medium in tube.	10 c. c. _____	5 c. c. _____	10 c. c.
Amount of culture added to diluted disinfectant.	0.5 c. c. to 5.0 c. c. _____	0.5 c. c. to 5.0 c. c. _____	0.1 c. c. to 5.0 c. c.
Resistance of test culture to phenol (dilutions killing in 10 minutes but not in 5 minutes).	1-90 _____	1-90 to 1-110 _____	No limits stated.
Condition of tube in test—	Plugged with cotton _____	Plugged with cotton _____	Open tubes.
Temperature of test—	20° C. _____	15-18° C. _____	20° C.
Time intervals of the test—	5, 10, and 15 minutes _____	2½, 5, 7½, and 10 minutes _____	5, 7½, 10, 12½, and 15 minutes.
Amount of medication mixture transferred (size of loop).	4 mm. loop (of No. 23 B. and S. gage wire).	4 mm. loop (of No. 27 Imperial gage wire).	Spiral loop (four spirals wrapped around a No. 13 B. and S. gage wire. Made of No. 23 B. and S. gage wire).
Calculation of phenol coefficient.	Highest dilution not killing in 5 minutes but killing in 10 minutes divided by same for phenol.	Highest dilution not killing in 5 minutes but killing in 7½ minutes divided by same for phenol.	Mathematical mean of highest dilutions showing no growth in 5, 10, and 15 minutes divided by same for phenol.

¹ Armour's. Special batch set aside for disinfectant testing.² Allen and Hanbury's.

tive subcultures frequently indicate that the organism has been killed, when in fact it may have been only rendered incapable of growing in this culture medium.

The curtailment in labor, time, and material through the use of the F. D. A. method renders it particularly valuable where a large number of samples are involved. The F. D. A. method is considerably superior to the R-W method in producing consistent results (4, 12). The medium employed is better adapted to bacterial growth, and the technic is not restricted to the use of one test organism (*Eberthella typhi*) as is the case of the R-W and H. L. methods. Moreover, the stock cultures of *E. typhi* and *Staphylococcus aureus*, the organisms principally used in germicidal testing, remain sufficiently constant in their resistance to phenol, when grown on an adjusted medium, to necessitate but one phenol control, though two controls are used frequently as an additional check. This allows the use of nine dilutions of the unknown with 30-second intervals between transfers, or 14 when 20-second intervals are used. With a little practice, 20-second intervals allow sufficient time.

The F. D. A. method will be used by this laboratory in determining the dilutions at which miscible coal-tar disinfectants, and many other products to which the method is applicable, should be used for disinfecting purposes. As heretofore, this dilution should be at least equal in strength to a 5 per cent solution of phenol when tested against *Eberthella typhi* (20 times the phenol coefficient figure) and should be based on a phenol coefficient not higher than that obtained by the F. D. A. method.

Food and Drug Administration Method

THE test organism is a 22-26 hour culture of *Eberthella typhi* (Hopkins strain) incubated and grown in nutrient broth at 37° C. The broth contains the following ingredients: 5 gm. of Liebig's beef extract, 5 gm. of chemically pure sodium chloride, and 10 gm. of Armour's peptone (for disinfectant testing) in 1,000 c. c. of distilled water. The mixture is boiled for 20 minutes, made up to original weight (or volume) with distilled water, and adjusted with NaOH to pH 6.8 using the colorimetric method (3, p. 405-421.) It is then filtered through paper, tubed (10 c. c. to each tube), and the tubes plugged with cotton and sterilized at 15 pounds pressure for 40 minutes. The test culture is transferred daily in this medium for not more than one month. At the end of each month, a fresh transfer is made from the stock culture. The stock culture is carried on agar slants of the same composition as the broth medium plus 1½ per cent Bacto-Agar (Difco), adjusted to pH 7.2 to 7.4. This medium is also filtered, tubed, plugged with cotton, sterilized, and slanted. The stock culture is transferred once a month, and the test organism is taken from the month-old stock culture. When the test organism has not been transferred daily, it is advisable to make four or five consecutive daily transfers in broth before using it for testing purposes, to be reasonably sure of its conforming to the phenol resistance requirements. When only one transfer has been skipped the following transfer from the 48-hour culture is usually satisfactory for use after 24 hours.

Transfers are made with the platinum loop used in the test. Only cultures giving readings within the following limits are considered satisfactory:

Phenol:	5 minutes	10 minutes	15 minutes
1:90 _____	+	+	0
1:100 _____	+	+	+
or			
1:90 _____	0	0	0
1:100 _____	+	+	0

The following reading is that most usually obtained and is the most convenient:

Phenol:	5 minutes	10 minutes	15 minutes
1:90 _____	+	0	0
1:100 _____	+	+	+

Phenol

The phenol used must meet the requirements of the United States Pharmacopoeia, and in addition the congealing point must not be below 40° C. A 5 per cent solution may be used as a stock solution if kept in a relatively cool place in well-stoppered amber-colored bottles protected from the light. This 5 per cent solution should be standardized with decinormal bromine (described under "phenol" (10, p. 283), or with sodium bromide and bromate solution (9, pp. 404-405).

Apparatus

Besides a number of accurately graduated pipettes, 100-c. glass-stoppered graduates or volumetric flasks are almost essential for the making of correct dilutions. All pipettes and graduates should be standardized. The test tubes for containing the dilutions should be large enough to permit transfers being made without touching the sides with the transfer needle. Lipped pyrex (to withstand constant flaming) test tubes 25 by 150 mm. serve very well as these seeding or medication tubes. A water bath for holding the dilutions at the desired temperature must be provided. To maintain the temperature practically constant during the period of the test, the bath should be made so as to contain a relatively large volume per surface area, and should be insulated. The lid is made with well-spaced holes admitting the 25-mm. tube, but not the lip. The most convenient form of subculture tubes (tubes containing medium for incubating the tested organisms, as well as for growing the test culture) are ordinary non-lipped bacteriological test tubes 20 by 150 mm. The racks for holding the subculture tubes may be any convenient style. Blocks of wood with a series of holes bored in them are quite satisfactory. Dimensions depend somewhat on the size of the incubator, but the holes should be well spaced to insure quick selection and easy manipulation during the test. It is an added convenience to have the holes large enough to admit the medication tubes while dilutions are being made. The transfers are made with a 4-mm. (inside diameter) single loop of number 23 B. & S. gage platinum wire, 1½ to 3 inches long, set in a suitable holder such as an aluminum or glass rod approximately 0.5 cm. in diameter.

Procedure

One per cent stock dilutions of the substance to be tested (or any other convenient dilution of the disinfectant, depending on the strength) are made up, usually in the glass-stoppered cylinders or volumetric flasks from which the individual dilutions are then prepared. For rapid routine work, the final dilutions may be made directly in the medication tubes. In this case all excess over 5 c. c. must be removed. For more precise work and when high dilutions are required or volatile sub-

stances are dealt with, it is preferable to make up all of the dilutions in volumetric flasks and then transfer 5 c. c. of the final dilution to the medication tubes. These tubes containing 5 c. c. of each dilution (including the phenol control) are placed in the water bath at 20° C. for five minutes until the temperature of the bath is reached. Even slight variations in temperature may affect the results. The dilutions should cover the range of the killing limits of the disinfectant within 5- and 15-minute periods and should at the same time be spaced sufficiently close together to insure the desired accuracy. Five-tenths of a cubic centimeter of the test culture is then added to each of the dilutions at a time interval corresponding to the interval at which the transfers are to be made. Thus by the time 10 tubes have been seeded at 30-second intervals, four and one-half minutes will have elapsed and a 30-second interval intervenes before the transference to the subcultures is commenced. The culture is added from a graduated pipette holding sufficient culture to seed all the tubes in any one set. The pipette may be loosely plugged with cotton at the mouth end before sterilizing, as a precautionary measure. Unfiltered culture is used, but it should be thoroughly shaken 15 minutes before use and allowed to settle. The temperature of the culture should be practically that of the water bath before being added.

In inoculating the medication tubes they should be held in a slanting position, after removal from the bath, and the culture run in without the tip of the pipette touching the disinfectant. The tip may be allowed to rest against the side of the tube just above the surface of the liquid. The tubes are agitated gently but thoroughly after the addition of the culture to insure even distribution of the bacteria. Five minutes from the time of seeding the first medication tube, transfer 1 loopful of the mixture of culture and diluted disinfectant from the medication tube to the corresponding subculture tube. To facilitate transfer of uniform drops of the medication mixture, the loop is bent to form a slight angle with the stem and the medication tube is held at an angle of 60°. In other words, as the loop is withdrawn, its plane should be parallel with the surface of the liquid. At the end of 30 seconds, a loopful is transferred from the second medication tube to the second subculture tube and the process continued for each successive dilution. Five minutes from the time of making the first transfer, a second set of transfers is begun for the 10-minute period and finally repeated for the 15-minute period. Before each transfer the loop is heated to red heat in the Bunsen flame and the mouth of every tube is flamed. Sterilization of the loop is effected immediately after making the previous transfer (before replugging the tubes) to allow time for sufficient cooling. Time does not permit flaming the tubes after making the transfer. For this reason, care in transferring and seeding is necessary. Due caution is observed to prevent either the seeding pipette or the transfer needle from touching the sides or mouth of the medication tube; neither should cotton threads be found adhering to the sides or mouth of these. After completion of the transferring, the subculture tubes are incubated at 37° C. for 48 hours and results read. Microscopic examination usually suffices for this, but occasionally agglutination with antityphoid serum will aid in reading doubtful results. A 3-day incubation period or agar streak or microscopic examination may be resorted to in determining feeble growth, especially when organisms other than *Eberthella typhi* are used.

There are certain types of germicidal agents, such as many of the mercury compounds, which give very high results by phenol coefficient tests (8). Due to the high inhibitory value of such substances in preventing growth

in the subcultures these figures are frequently misleading. For germicides used in the disinfection of such objects as surgical instruments, this is of particular importance and must be taken into account. Failure to appreciate this characteristic of certain compounds is much more likely to lead to error when *Staphylococcus aureus* is used rather than *Eberthella typhi* as the test organism. That false values may not be obtained for products of this type, or for any other disinfectant giving suspiciously high results, the subcultures should contain very large amounts of medium (not less than 200 c. c.) or they should be retransferred by carrying at least 4 loopfuls from the first subculture to a second tube of broth, as recommended by Shippen (8).

Other groups of disinfectants in common use, for which the phenol coefficient method of testing is not well adapted, are those compounds containing chlorine as the active agent as well as oxidizing agents in general. These are affected so materially by the presence of organic matter that a phenol coefficient statement may grossly misrepresent their value under practical conditions of use and is very apt to be misleading to the consumer when placed on the label.

Calculation of Phenol Coefficient

THE results of the test are expressed in terms of the phenol coefficient. This represents the germicidal value of the diluted disinfectant as compared with the diluted phenol control. It is a figure obtained by dividing the numerical value of the greatest dilution (the denominator of the fraction expressing the dilution) of the disinfectant capable of killing *Eberthella typhi* in 10 minutes but not in 5 minutes, by the greatest dilution of phenol showing the same results; that is, by the phenol control. Thus, if the results were as follows:

Disinfectant (X):	5 minutes	10 minutes	15 minutes
1-300	0	0	0
1-325	+	0	0
1-350	+	0	0
1-375	+	+	0
1-400	+	+	+
Phenol:			
1-90	+	0	0
1-100	+	+	+

The phenol coefficient would be $\frac{350}{90} = 3.89$.

If none of the dilutions show growth in 5 minutes and killing in 10 minutes, the hypothetical dilution may be estimated in certain cases. This may be done only when any three consecutive dilutions show the following results:

The first, no growth in 5 minutes; the second, growth in 10 minutes but not in 15 minutes; and the third, growth in 15 minutes; for example:

Disinfectant (X):	5 minutes	10 minutes	15 minutes
1-300	0	0	0
1-350	+	+	0
1-400	+	+	+
Phenol:			
1-90	0	0	0
1-100	+	+	0

the estimated phenol coefficient would be $\frac{325}{95} = 3.42$.

To avoid giving an impression of fictitious accuracy, the phenol coefficient is calculated to the nearest 0.1 unless the coefficient is less than 1.0. Thus, in the

examples cited above, the phenol coefficients would be reported as 3.9 and 3.4 instead of 3.89 and 3.42.

In the preceding description, *Eberthella typhi* has been mentioned as the test organism. Wherever any expression of phenol coefficient occurs in literature, on labels, etc., it is assumed to mean the *E. typhi* phenol coefficient, unless otherwise stated. It is, however, the distinct intention of this department not to limit the test to the use of one organism. In fact, the test has been found adaptable to the use of a wide variety of bacterial species in the determination of phenol coefficients. In cases where some of the more strictly parasitic bacteria are used, modifications in media are necessitated, and, of course, a change in the phenol dilutions. The writers are not in a position at this time to prescribe the limits of resistance for many of the organisms that might be used. Therefore discussion of the exact technic is here omitted, with the exception of that for *Staphylococcus aureus*. Suggestions for the use of certain representative types may, however, be found in a paper by Reddish (5). When any test organism other than *E. typhi* is used it should be distinctly designated when stating the phenol coefficient.

S. aureus has been found to be an extremely useful organism for testing disinfectants and antiseptics and has been used for this purpose for a number of years. When substituted in the above test the technic remains exactly the same. The phenol dilutions, however, must be changed. The resistance of any strain of *S. aureus* used in this test must come within the following limits: At 20° C. it must survive a 1-60 dilution of phenol for 5 minutes and a 1-70 dilution for 15 minutes. The following is the minimal resistance that would be acceptable:

	5 minutes	10 minutes	15 minutes
Phenol:			
1-60	+	0	0
1-70	+	+	+

In the bacteriological examination of disinfectants, the *Eberthella typhi* and the *S. aureus* phenol coefficients give, in general, sufficient information to render tests with other organisms unnecessary, except in special instances. The commonly accepted criterion that disinfectants for general use be employed at a dilution equivalent to the germicidal efficiency of 5 per cent phenol against *E. typhi* (that is, 20 times the *E. typhi* phenol coefficient) allows a reasonable margin of safety for the destruction of infective agents likely to be the object of general disinfection about premises with the possible exception of *Mycobacterium tuberculosis*. *S. aureus*, due to its ubiquity, resistance and ever-ready tendency to cause infection, should always be employed in testing those substances recommended for personal use or as applications for wounds. If the disinfectant is recommended for use externally the temperature of test should be 20° C., but where such substances are recommended for use in the body cavities, such as for mouth washes, gargles, douches, etc., this test should be conducted at 37°. In such case the test should be designated "The F. D. A. method (special) *S. aureus*, 37° C." At body temperature the *S. aureus* should show the following resistance to phenol:

	5 minutes	10 minutes	15 minutes
1-80	+	0	0
1-90	+	+	+
Or			
1-80	+	0	0
1-90	+	+	0

The previous description of this method (5) differed from this only in allowing a slightly wider latitude in the resistance of the test organism against phenol.

Other Tests for Germicides*

THE limitations of the phenol coefficient make it necessary in some cases to judge the germicidal preparation by other tests or by additional tests. This is particularly true of preparations that are not completely soluble or miscible in water. It is also true of certain preparations designated as antiseptics.

Soluble antiseptics or antiseptics completely miscible with water can be tested, of course, by the procedure already described as the F. D. A. *Staphylococcus aureus* phenol coefficient method. In the testing of these substances, however, the phenol coefficient is not obtained necessarily, the phenol figure being used merely as a check of the resistance of the test organism. The information desired is the concentration which will kill in five minutes.

In an effort to simulate practical conditions, it is frequently advisable to conduct the tests in the presence of blood serum. Sterile horse serum in a concentration of 10 per cent is ordinarily used, both in the germicidal and inhibitory tests. Special claims and uses of a product, however, frequently indicate the desirability of a higher concentration of this organic enrichment.

The following methods designed for the testing of insoluble and immiscible products are in use in this laboratory at the present time. Some of them have been used for years and have been described previously (6). Laboratory tests, of course, cannot duplicate the exact conditions found in practice. The procedures here outlined, however, are as close an approach to practical conditions as is feasible in routine laboratory tests, and reveal the obviously useless preparations. It should be noted that inhibitory tests are considered along with other facts in interpreting whether or not the substance will be of value in practical use. It must be remembered that not only bacteriological but physiological and pharmacological facts frequently must be taken into consideration in judging many substances.

The Wet Filter-Paper Method

The wet filter-paper method is a germicidal test rather than a test of inhibitory properties. It is used when the substance to be tested is not soluble or completely miscible with water, or for substances that are to be used in high concentration, such as soaps, tooth pastes, suppositories, dyes, dusting powders, salves, and ointments. If the substance is to be used in the body cavities the test is carried out at 37° C.; if not, the test is carried out at 20°, or at room temperatures, and the temperature is recorded.

No. 2 Whatman filter paper is cut into pieces about 0.5 cm. square, and sterilized in a plugged test tube at temperatures below 170° C. to prevent charring. A suitable number of the paper squares are then impregnated with *Staphylococcus aureus*, or other test organisms, by immersion in a 24-hour broth culture of the organism. The culture must have the standard resistance required for phenol coefficient testing. The wet inoculated squares are then placed in the liquid or solid substance to be tested in such a way as to be completely covered and in intimate contact. At the end of 5 minutes, 10 minutes, 15 minutes, or 1 hour, or any

*According to current usage the word "antiseptic" has two meanings: to kill bacteria or to prevent their growth, depending upon the use of the product. Products such as salves, ointments, and dressings that remain in contact with the body for long periods of time, may be designated properly as antiseptics if they inhibit the growth of bacteria. On the other hand, mouth washes, douches, gargles, and preparations of like nature are in contact with the body for but brief periods of time and exert negligible inhibitory action. These may be described properly as antiseptics only if they will destroy bacteria under the conditions of use; that is, in the dilutions recommended and in a period of time comparable to that in which they would have an opportunity to act when used as directed.

other desired length of time, the wet papers are removed with a sterilized, stiff, platinum wire bent at a sharp angle to form a hook and placed in 10 c. c. of sterile broth. After as much of the disinfectant as possible has been removed (in the case of sticky substances, the needle must be used to aid in freeing the squares of adherent germicide) the squares are retransferred to a fresh tube of sterile broth (10 c. c.) and the tubes incubated at 37° for 48 hours, when they are observed for evidence of growth.

It will be noted that in this test resubcultures are always required, since the first tube of broth to which the filter-paper squares have been added frequently contains sufficient antiseptic to exhibit inhibition of growth. Both tubes of broth are usually incubated.

The Dry Filter-Paper Method

The dry filter-paper method is used in tests of fumigants and of oils that are to be used where moisture is absent. It is similar to the wet filter-paper test, squares of paper being used that have been impregnated as described under the test above, except the squares are dried for two days in a sterile Petri dish in the 37° C. incubator. This test can be used successfully only with organisms capable of resisting the drying. *Eberthella typhi* will not withstand the drying. In the writers' work *Staphylococcus aureus* is the usual test organism. The inoculated dried paper squares may be used at any time after drying up to 30 days, but the resistance of the organism at no time should fall so low that it is incapable of withstanding a 1:80 dilution of phenol for five minutes at 20°. It should be noted that control tests with non-medicated squares should always be carried out to test the viability of the test organism. As in the wet filter-paper method, resubcultures are always necessary.

The Agar-Plate Method

The agar-plate method is a test for inhibitory properties and is used for substances remaining in contact with the body in the absence of serous body fluids. Examples of substances which may be tested by this method are salves, dusting powders, creams, plasters, pads, adhesive tape, catgut, and suppositories. The test organism ordinarily used is *Staphylococcus aureus*, but for special purposes the test may be used with any organism capable of growing on agar. The agar is of the same composition as that previously described for carrying stock cultures of the test organism.

Fifteen to twenty cubic centimeters of agar is melted and cooled to 42°-45° C. To this is added 0.1 c. c. of a 24-hour broth culture of the test organism. The inoculated agar is then poured into sterile Petri plate and allowed to harden. As soon as the agar has hardened, the test substance is placed in intimate contact with the surface of the agar. If a salve, it is first warmed just sufficiently to soften it and thus secure a complete peripheral contact. As a control, warmed sterile petrolatum may be placed on another portion of the plate. The plates are incubated 24-48 hours under unglazed porcelain tops at 37° C. and then are examined for evidence of inhibition. If the preparation is antiseptic or inhibitory, a zone of clear agar will be noted around the place where the substance has been in contact and the width of the zone will indicate the diffusibility of the inhibitory (antiseptic) agent. If there is no inhibition, growth of the test organism will be observed adjacent to and even under the test substance.

The Serum Agar-Plate Method

Preparations recommended for use on open wounds, cuts, etc., will be effective only if they exhibit activity in the presence of serous fluids. In testing such preparations the agar-plate method is modified by the addition of 10 per cent sterile horse serum to the agar.

Disinfectants and antiseptics for use in the absence of organic matter:

A. Preparations for drinking water.⁶

Phenol coefficient technic—*E. typhi* 20° C. (Note: 0.1 c. c. of culture to 10 c. c. of diluted preparation.)

Intestinal antiseptics.⁷

Figures Useful in Making Dilutions in Testing Disinfectants (11)

(5 c. c. of disinfectant+95 c. c. of distilled water=solution A.)

Dilution	Solution A C. c.	Distilled water C. c.	Solution A C. c.	Distilled water C. c.	Solution A C. c.	Distilled water C. c.
1:20	= 20	+ 0	or 10	+ 0	or 4	+ 0
1:25	= 20	+ 5	or 10	+ 2½	or 4	+ 1
1:30	= 20	+ 10	or 10	+ 5	or 4	+ 2
1:35	= 20	+ 15	or 10	+ 7½	or 4	+ 3
1:40	= 20	+ 20	or 10	+ 10	or 4	+ 4
1:45	= 20	+ 25	or 10	+ 12½	or 4	+ 5
1:50	= 20	+ 30	or 10	+ 15	or 4	+ 6
1:55	= 20	+ 35	or 10	+ 17½	or 4	+ 7
1:60	= 20	+ 40	or 10	+ 20	or 4	+ 8
1:65	= 20	+ 45	or 10	+ 22½	or 4	+ 9
1:70	= 20	+ 50	or 10	+ 25	or 4	+ 10
1:80	= 20	+ 60	or 10	+ 30	or 4	+ 12
1:90	= 20	+ 70	or 10	+ 35	or 4	+ 14
1:100	= 20	+ 80	or 10	+ 40	or 4	+ 16
1:110	= 20	+ 90	or 10	+ 45	or 4	+ 18
1:120	= 20	+ 100	or 10	+ 50	or 4	+ 20
1:130	= 20	+ 110	or 10	+ 55	or 4	+ 22
1:140	= 20	+ 120	or 10	+ 60	or 4	+ 24
1:150	= 20	+ 130	or 10	+ 65	or 4	+ 26
1:160	= 20	+ 140	or 10	+ 70	or 4	+ 28
1:170	= 20	+ 150	or 10	+ 75	or 4	+ 30
1:180	= 20	+ 160	or 10	+ 80	or 4	+ 32
1:200	= 20	+ 180	or 10	+ 90	or 4	+ 36
1:225	= 20	+ 205	or 4	+ 41	or 2	+ 20½
1:250	= 20	+ 230	or 4	+ 46	or 2	+ 23
1:275	= 20	+ 255	or 4	+ 51	or 2	+ 25½
1:300	= 20	+ 280	or 4	+ 56	or 2	+ 28
1:325	= 20	+ 305	or 4	+ 61	or 2	+ 30½
1:350	= 20	+ 330	or 4	+ 66	or 2	+ 33
1:375	= 20	+ 355	or 4	+ 71	or 2	+ 35½
1:400	= 20	+ 380	or 4	+ 76	or 2	+ 38
1:450	= 20	+ 430	or 4	+ 86	or 2	+ 43
1:500	= 20	+ 480	or 4	+ 96	or 2	+ 48

(1 c. c. of disinfectant+99 c. c. of distilled water=solution B)

Dilution	Solution B C. c.	Distilled water C. c.	Solution B C. c.	Distilled water C. c.	Solution B C. c.	Distilled water C. c.
1:100	= 100	+ 0	or 10	+ 0	or	
1:110	= 100	+ 10	or 10	+ 1	or	
1:120	= 100	+ 20	or 10	+ 2	or	
1:130	= 100	+ 30	or 10	+ 3	or	
1:140	= 100	+ 40	or 10	+ 4	or	
1:150	= 100	+ 50	or 10	+ 5	or	
1:160	= 100	+ 60	or 10	+ 6	or	
1:180	= 100	+ 80	or 10	+ 8	or	
1:200	= 100	+ 100	or 10	+ 10	or 4	+ 4
1:225	= 100	+ 125	or 10	+ 12½	or 4	+ 5
1:250	= 100	+ 150	or 10	+ 15	or 4	+ 6
1:275	= 100	+ 175	or 10	+ 17½	or 4	+ 7
1:300	= 100	+ 200	or 10	+ 20	or 4	+ 8
1:325	= 100	+ 225	or 10	+ 22½	or 4	+ 9

Dilution	Solution B C. c.	Distilled water C. c.	Solution B C. c.	Distilled water C. c.	Solution B C. c.	Distilled water C. c.
1:350	= 100	+ 250	or 10	+ 25	or 4	+ 10
1:375	= 100	+ 275	or 10	+ 27½	or 4	+ 11
1:400	= 100	+ 300	or 10	+ 30	or 4	+ 12
1:450	= 10	+ 30	or 4	+ 12	or 2	+ 6
1:500	= 10	+ 35	or 4	+ 14	or 2	+ 7
1:550	= 10	+ 40	or 4	+ 16	or 2	+ 8
1:600	= 10	+ 45	or 4	+ 18	or 2	+ 9
1:650	= 10	+ 50	or 4	+ 20	or 2	+ 10
1:700	= 10	+ 55	or 4	+ 22	or 2	+ 11
1:750	= 10	+ 60	or 4	+ 24	or 2	+ 12
1:800	= 10	+ 65	or 4	+ 26	or 2	+ 13
1:850	= 10	+ 70	or 4	+ 28	or 2	+ 14
1:900	= 10	+ 75	or 4	+ 30	or 2	+ 15
1:950	= 10	+ 80	or 4	+ 32	or 2	+ 16
1:1,000	= 5	+ 40	or 4	+ 32	or 2	+ 16
1:1,100	= 5	+ 45	or 4	+ 36	or 2	+ 18
1:1,200	= 5	+ 50	or 4	+ 40	or 2	+ 20
1:1,300	= 5	+ 55	or 4	+ 44	or 2	+ 22
1:1,400	= 5	+ 60	or 4	+ 48	or 2	+ 24
1:1,500	= 5	+ 65	or 4	+ 52	or 2	+ 26
1:1,600	= 5	+ 70	or 4	+ 56	or 2	+ 28
1:1,700	= 5	+ 75	or 4	+ 60	or 2	+ 30
1:1,800	= 5	+ 80	or 4	+ 64	or 2	+ 32
1:1,900	= 5	+ 85	or 4	+ 68	or 2	+ 34
1:2,000	= 5	+ 95	or 4	+ 76	or 2	+ 38
1:2,200	= 5	+ 105	or 4	+ 84	or 2	+ 42
1:2,400	= 5	+ 115	or 4	+ 92	or 2	+ 46
1:2,600	= 5	+ 125	or 4	+ 100	or 2	+ 50
1:2,800	= 5	+ 135	or 4	+ 108	or 2	+ 54
1:3,000	= 5	+ 145	or 4	+ 116	or 2	+ 58
1:3,200	= 5	+ 155	or 4	+ 124	or 2	+ 62

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				Raw Wool Washing, Detergents for	May 63
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				Soaps, Bentonite in	Dec. 71
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				Soaps, Floor Scrub	Oct. 31
				Soaps in Silk Degumming	Dec. 65
				Soaps, Manufacture of English Soft	May 67

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Testing of Antiseptics	July 103		
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Textile Detergents, The Trend in	July 31	Zinc Catalysis in Fat Splitting	Mar. 63

Percentages of Alkali Necessary to Saponify Various Common Oils and Fats

Oil or Fat	% NaOH	% KOH
Coconut Oil	17.9—18.8	25.1—26.3
Corn Oil	13.2—13.8	18.6—19.3
Cottonseed Oil	13.6—14	19.1—19.6
Grease	13.6—14	19.1—19.7
Lard Oil	13.6—14	19.1—19.6
Linseed Oil	13.5—14	18.9—19.6
Olive Oil Foots	13.5—14	18.9—19.5
Palm Oil	14 —14.6	19.6—20.5
Rosin	12.1—13.8	17 —19.3
Tallow	13.8—14.3	19.3—20.0
Whale Oil	13.4—13.8	18.8—19.4

Comparative Values of Caustic Soda Solutions

	Sp. Gr. @ 60° F.	Tw. 60° F.	Bé 60° F.	NaOH %	Na ₂ O %	Bé 60° F.	Tw. 60° F.	Sp. Gr. @ 60° F.
1	1.6	2.2	1.011	26	20.18	32.4	57.6	1.288
2	3.1	4.4	1.022	27	20.95	33.4	59.4	1.299
3	4.6	6.6	1.033	28	21.70	34.3	62.0	1.310
4*	6.3	9.0	1.045	29	22.40	35.2	64.0	1.320
5	7.7	11.2	1.056	30	23.15	36.1	66.2	1.331
6	9.1	13.4	1.067	31	24.00	36.9	68.2	1.341
7	10.5	15.6	1.078	32	24.80	37.8	70.4	1.352
8	11.9	17.8	1.089	33	25.60	38.6	72.4	1.362
9	13.2	20.0	1.100	34	26.38	39.4	74.6	1.373
10	14.5	22.2	1.111	35	27.15	40.2	76.6	1.383
11	15.8	24.4	1.122	36	27.90	40.9	78.6	1.393
12	17.1	26.6	1.133	37	28.70	41.7	80.6	1.403
13	18.3	28.8	1.144	38	29.45	42.4	82.6	1.413
14	19.5	31.0	1.155	39	30.22	43.1	84.6	1.423
15	20.7	33.4	1.167	40	31.00	43.8	86.6	1.433
16	21.9	35.6	1.178	41	31.80	44.5	88.6	1.443
17	23.1	37.8	1.189	42	32.60	45.2	90.6	1.453
18	24.2	40.0	1.200	43	33.35	45.9	92.6	1.463
19	25.2	42.0	1.210	44	34.10	46.5	94.4	1.472
20	26.3	44.2	1.221	45	34.90	47.1	96.2	1.481
21	27.4	46.6	1.233	46	35.66	47.8	98.2	1.491
22	28.5	48.8	1.244	47	36.45	48.4	100.2	1.501
32	29.5	51.0	1.255	48	37.22	49.0	102.0	1.510
24	30.5	53.2	1.266	49	37.99	49.6	104.0	1.520
25	31.5	55.4	1.277	50	38.75	50.2	105.8	1.529

FATTY ACIDS IN SOAP OILS

Glycerides of Acids	Coconut Oil	Corn Oil	Cottonseed Oil	Linseed Oil	Olive Oil	Palm Oil	Palm Kernel Oil	Peanut Oil	Sesame Oil	Soyabean Oil	Tallow	Whale Oil
Arachidic	—	0.4	0.6	—	0.2	—	—	3.6	4.0	0.7	—	—
Lignoceric	—	0.2	—	—	—	0.1	—	2.9	0.4	0.1	—	—
Linolenic	—	—	—	34.1	—	—	—	—	—	2.2	—	—
Linolic	—	39.1	42.0	48.5	3.9	9.5	1.0	23.1	35.2	49.3	—	20.0
Myristic	20.0	—	0.4	—	Trace	0.6	16.0	—	—	—	2.0	8.0
Oleic	2.0	43.4	35.0	5.0	83.1	43.2	16.5	56.7	46.0	32.0	44.5	25.0
Palmitic	7.0	7.3	20.0	2.7	9.2	44.0	6.5	7.3	7.3	6.5	29.0	12.0
Palmitoleic	—	—	—	—	—	—	—	—	—	—	—	17.0
Stearic	5.0	3.3	2.0	5.4	2.0	2.9	1.0	5.5	4.4	4.2	24.5	—

Coconut oil also contains 10% Capric, 2% Caproic, 9% Caprylic and 45% Lauric. Palm Kernel Oil contains 6% Capric, 3% Caprylic and 50% Lauric. Whale Oil contains 18% Clupandonic.

APPROXIMATE CONSTANTS OF SOAP OILS

Oil or Fat	Sp. Gr. (Water at 15°)	Sap. No.	Iodine Value	Titer °C.	% Non-Sap.
Castor Oil	0.958—0.968	177—187	83—86	3°—	0.3—0.5%
Coconut Oil	0.926	251—263	8—10	20°—23°	0.2
Corn Oil	0.921—0.927	186—193	120—130	15°—19°	1.5—3.0%
Cottonseed Oil	0.915—0.926	191—196	103—115	32°—38°	0.7—1.6%
Linseed Oil	0.931—0.938	189—196	170—204	19°—21°	0.5—1.6%
Olive Oil Foots	0.914—0.919	189—195	79—86	17°—21°	2.0—3.0%
Palm Oil	0.921—0.925	196—205	48—53	42°—45°	0.7—1.0%
Palm Kernel Oil	0.873/99°	244—255	16—23	20°—25°	0.2—0.5%
Peanut Oil	0.911—0.926	185—192	83—95	28°—30°	0.5—1.0%
Sesame Oil	0.920—0.926	188—193	103—115	21°—24°	1.0—1.8%
Soya Bean Oil	0.922—0.925	191—194	125—140	21°—24°	0.3—0.6%
Tallow (beef)	0.943—0.952	193—200	35—47	43°—45°	
Whale Oil	0.922—0.926	188—194	110—150	22°—24°	1.0—3.0%

TEMPERATURE CONVERSION TABLE

Centigrade to Fahrenheit

Temp. °C.	0	1	2	3	4	5	6	7	8	9
0	+32.0	30.2	28.4	26.6	24.8	23.0	21.2	19.4	17.6	15.8
-10	+14.0	12.2	10.4	8.6	6.8	5.0	3.2	+1.4	-0.4	-2.2
-20	-4.0	5.8	7.6	9.4	11.2	13.0	14.8	16.6	18.4	20.2
-30	-22.0	23.8	25.6	27.4	29.2	31.0	32.8	34.6	36.4	38.2
-40	-40.0	41.8	43.6	45.4	47.2	49.0	50.8	52.6	54.4	56.2
-50	-58.0	59.8	61.6	63.4	65.2	67.0	68.8	70.6	72.4	74.2
-60	-76.0	77.8	79.6	81.4	83.2	85.0	86.8	88.6	90.4	92.2
-70	-94.0	95.8	97.6	99.4	101.2	103.0	104.8	106.6	108.4	110.2
-80	-112.0	113.8	115.6	117.4	119.2	121.0	122.8	124.6	126.4	128.2
-90	-130.0	131.8	133.6	135.4	137.2	139.0	140.8	142.6	144.4	146.2
-100	-148.0	149.8	151.6	153.4	155.2	157.0	158.8	160.6	162.4	164.2
0	32.0	33.8	35.6	37.4	39.2	41.0	42.8	44.6	46.4	48.2
10	50.0	51.8	53.6	55.4	57.2	59.0	60.8	62.6	64.4	66.2
20	68.0	69.8	71.6	73.4	75.2	77.0	78.8	80.6	82.4	84.2
30	86.0	87.8	89.6	91.4	93.2	95.0	96.8	98.6	100.4	102.2
40	104.0	105.8	107.6	109.4	111.2	113.0	114.8	116.6	118.4	120.2
50	122.0	123.8	125.6	127.4	129.2	131.0	132.8	134.6	136.4	138.2
60	140.0	141.8	143.6	145.4	147.2	149.0	150.8	152.6	154.4	156.2
70	158.0	159.8	161.6	163.4	165.2	167.0	168.8	170.6	172.4	174.2
80	176.0	177.8	179.6	181.4	183.2	185.0	186.8	188.6	190.4	192.2
90	194.0	195.8	197.6	199.4	201.2	203.0	204.8	206.6	208.4	210.2
100	212.0	213.8	215.6	217.4	219.2	221.0	222.8	224.6	226.4	228.2
110	230.0	231.8	233.6	235.4	237.2	239.0	240.8	242.6	244.4	246.2
120	248.0	249.8	251.6	253.4	255.2	257.0	258.8	260.6	262.4	264.2
130	266.0	267.8	269.6	271.4	273.2	275.0	276.8	278.6	280.4	282.2
140	284.0	285.8	287.6	289.4	291.2	293.0	294.8	296.6	298.4	300.2
150	302.0	303.8	305.6	307.4	309.2	311.0	312.8	314.6	316.4	318.2
160	320.0	321.8	323.6	325.4	327.2	329.0	330.8	332.6	334.4	336.2
170	338.0	339.8	341.6	343.4	345.2	347.0	348.8	350.6	352.4	354.2
180	356.0	357.8	359.6	361.4	363.2	365.0	366.8	368.6	370.4	372.2
190	374.0	375.8	377.6	379.4	381.2	383.0	384.8	386.6	388.4	390.2
200	392.0	393.8	395.6	397.4	399.2	401.0	402.8	404.6	406.4	408.2

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